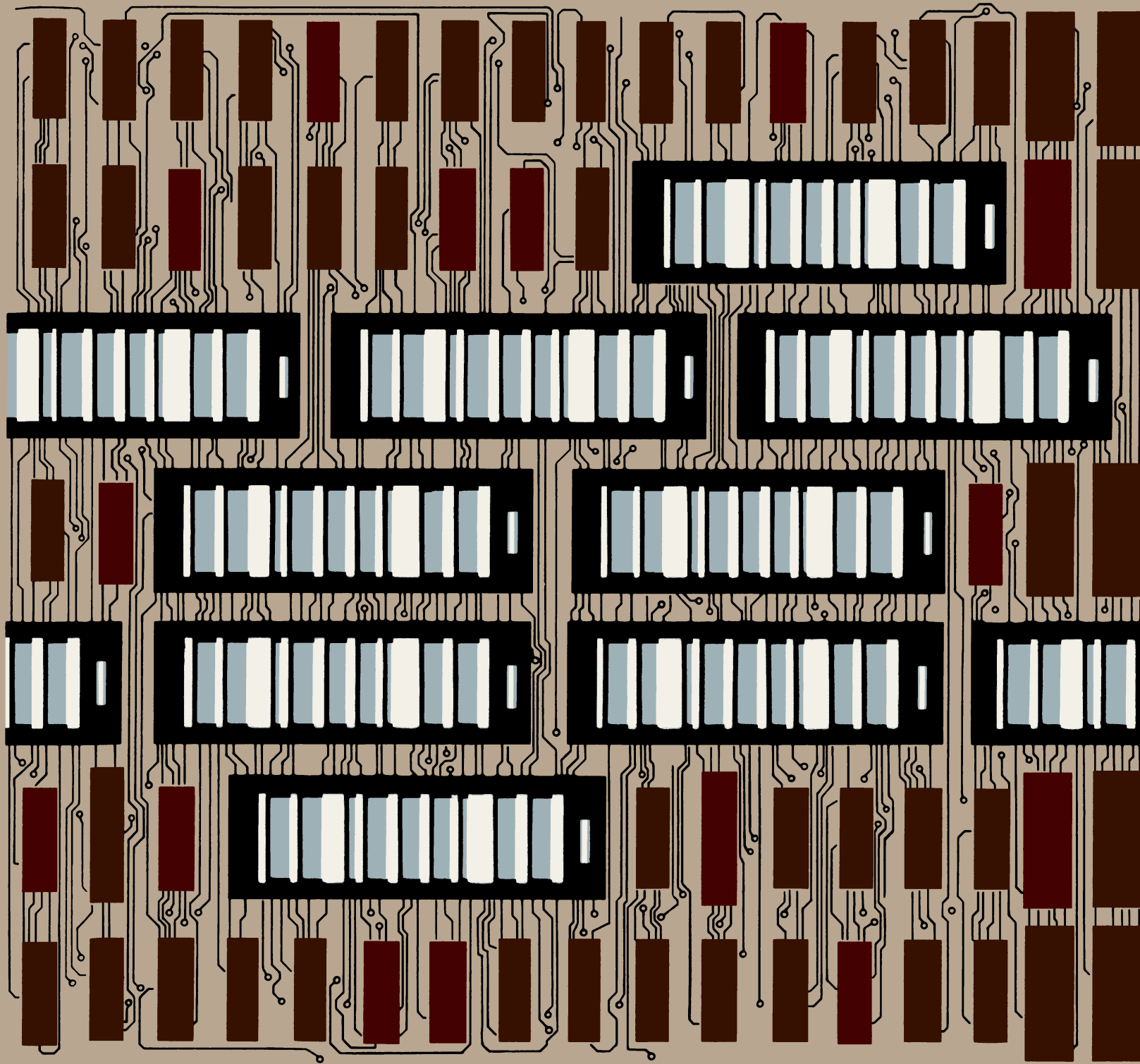


VAX-11/750

Installation and Acceptance Manual



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VAX-11/750
Installation and
Acceptance Manual

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PREFACE

MANUAL OBJECTIVES

The *VAX-11/750 Installation and Acceptance Test Manual* describes the procedures used to:

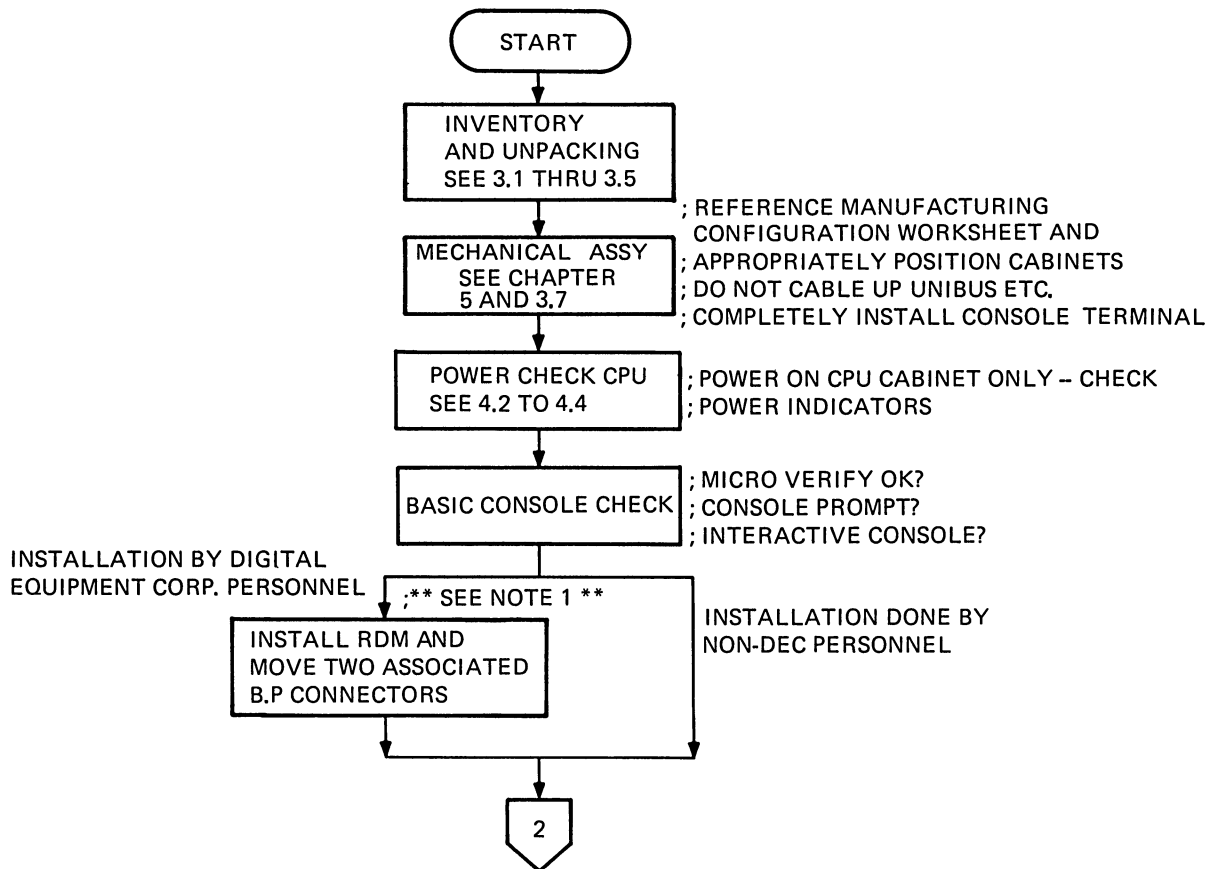
- Unpack and inventory VAX-11/750
- Install VAX-11/750 and associated peripheral gear
- Operate CPU front panel
- Use console commands
- Run diagnostic
- Run UETP

INSTALLATION PROCESS FLOW

The following installation process flow diagrams provide a systematic approach to installing the VAX-11/750. These diagrams have been designed with the goal of minimizing the installation time.

When you can complete an installation process flow step and continue on to the next step, this implies success. If, during a step, a problem is encountered, corrective action should be performed to the point of establishing any part(s) requirements for a fix. Thus the installation progresses as far through option checkout as possible. When you are using a mass storage device at diagnostic checkout and a failure is encountered, you would use the diagnostic load path from the TU58.

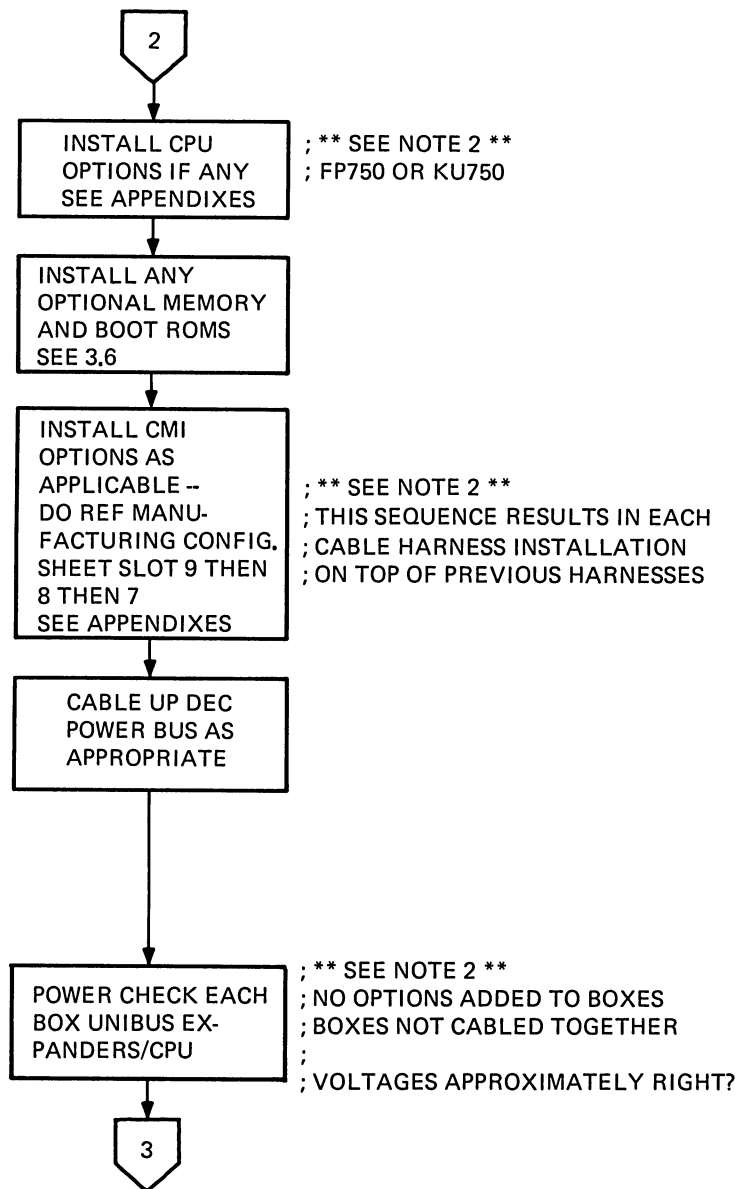
A CPU spares kit must be taken to an installation in support of most problems that prevent one from testing options. A REMOTE DIAGNOSIS option level kit (KC750-CA or KC750-DA) must also be taken to the site in all cases except when a customer indicates that he will definitely not be purchasing a REMOTE DIAGNOSIS contract. When this is the case, the RDM from the CPU spares kit is used in support of the installation as addressed by the installation process flow.



NOTE 1

THE REMOTE DIAGNOSTIC MODULE OR KIT IS THE PROPERTY OF DEC F.S.

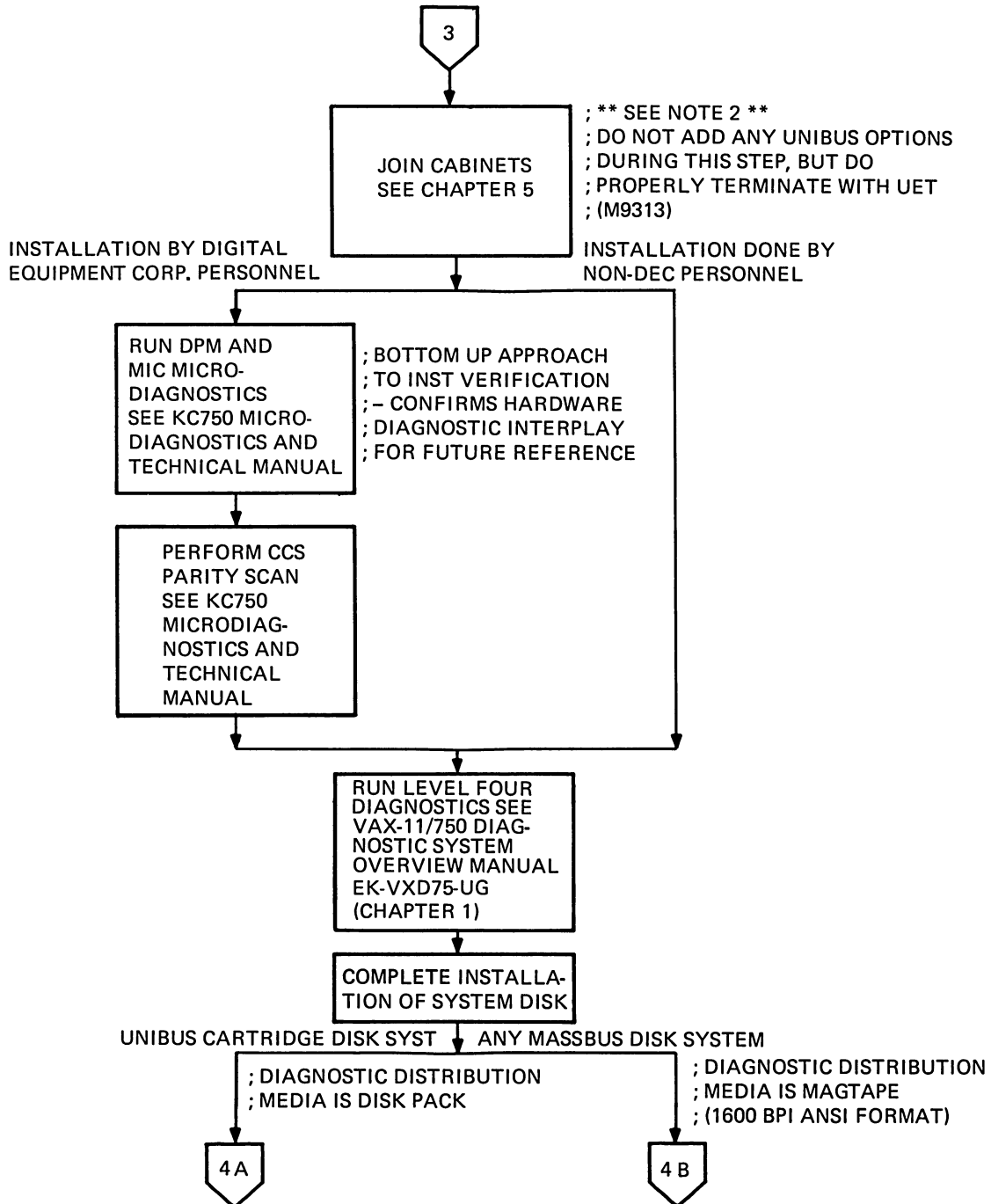
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NOTE 2

MOST CONFIGURATIONS WILL BE DOCK MERGED, HOWEVER, SOME ARE NOT. IF A SYSTEM HAS BEEN THRU THE FA&T PROCESS, IT WILL BE SHIPPED WITH OPTIONAL MODULES, UNIBUS CONTROLLERS ETC. ALREADY MOUNTED IN THEIR RESPECTIVE LOCATIONS.

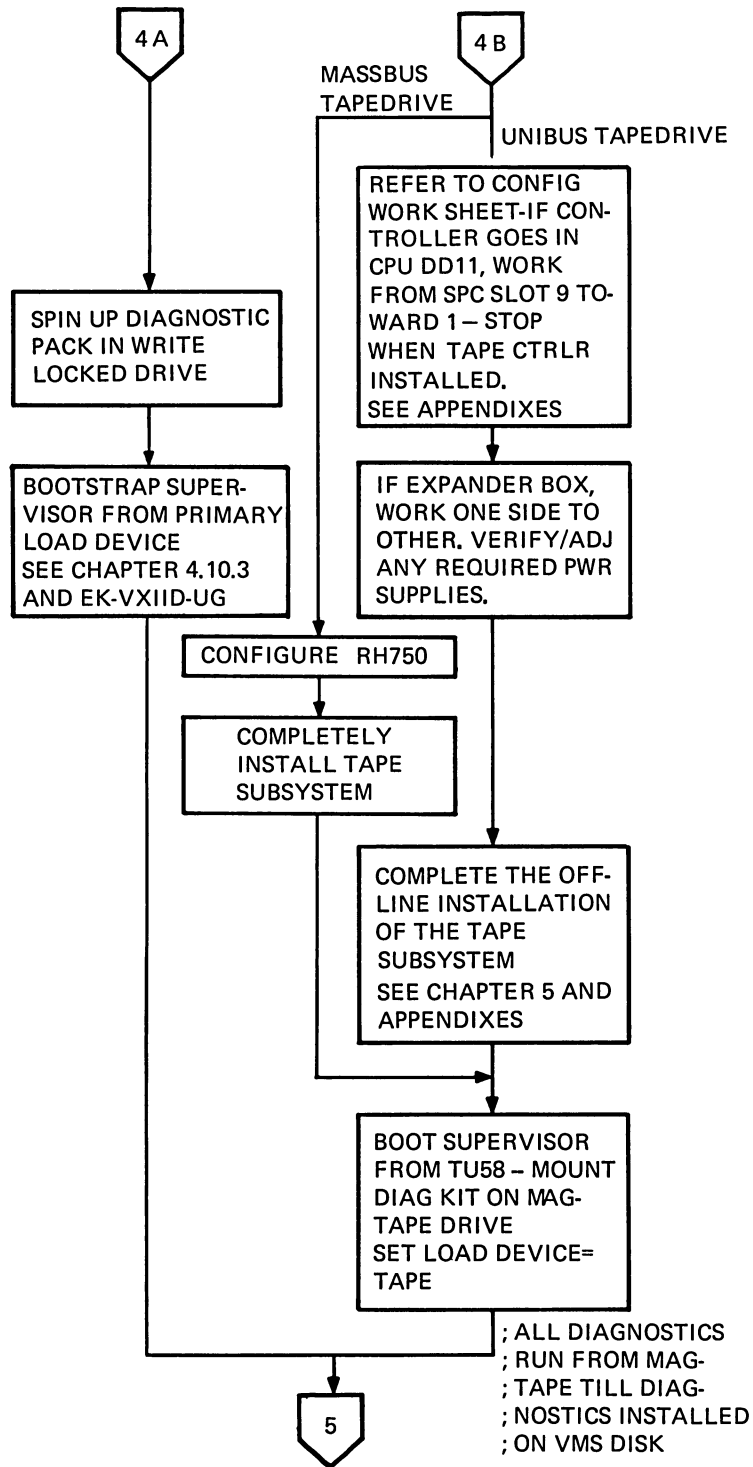
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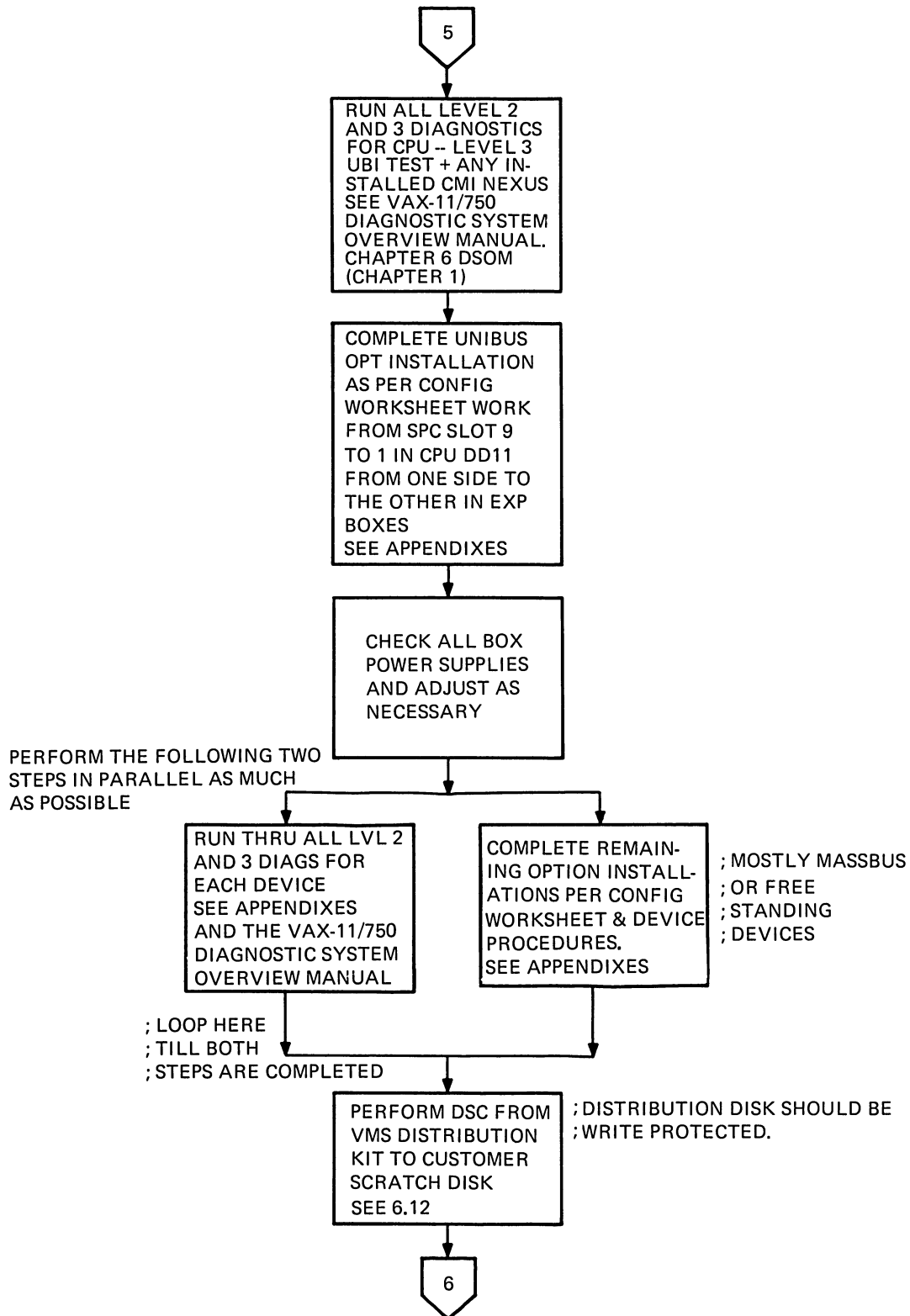
NOTE 2

MOST CONFIGURATIONS ARE DOCK MERGED, HOWEVER, SOME ARE NOT. IF A SYSTEM HAS BEEN THRU THE FA&T PROCESS, IT WILL BE SHIPPED WITH OPTIONAL MODULES, UNIBUS CONTROLLERS ETC. ALREADY MOUNTED IN THEIR RESPECTIVE LOCATIONS.

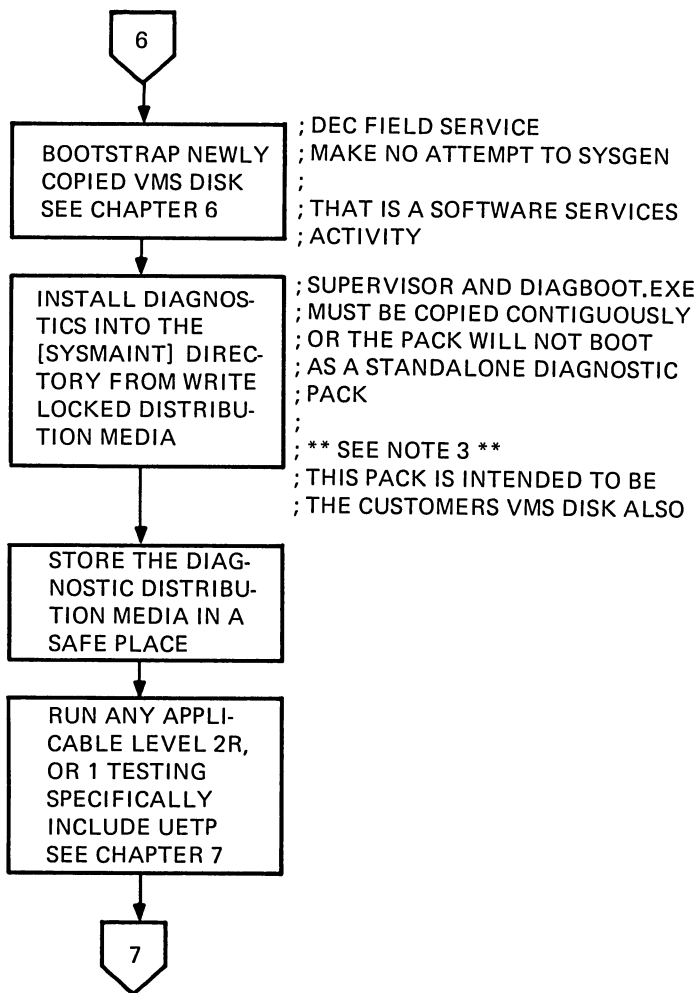
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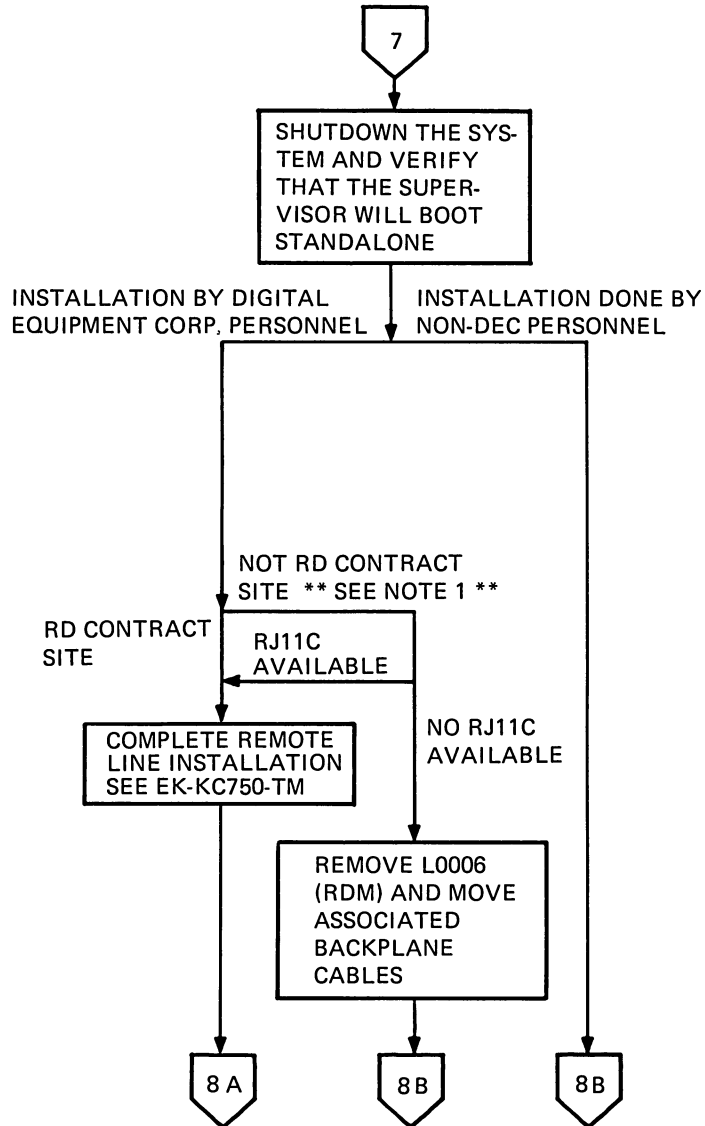
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NOTE 3

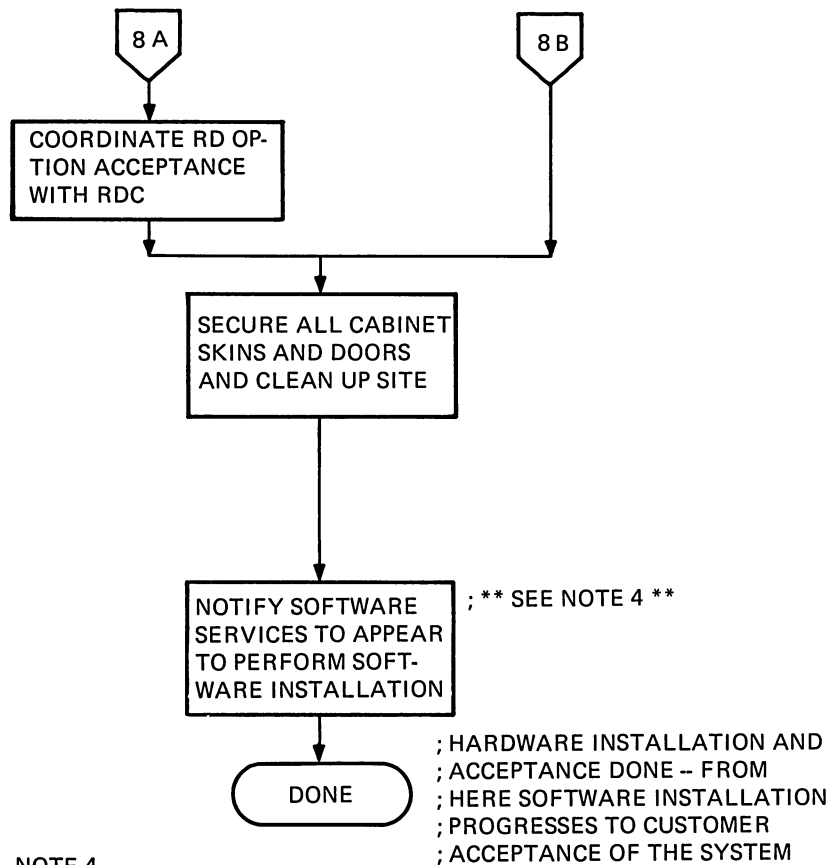
THE DIAGNOSTIC DISTRIBUTION KIT IS THE PROPERTY OF DEC F.S. AND IS SO LABELED. IT IS LEFT AT THE CUSTOMER SITE FOR AS LONG AS THE INSTALLATION IS UNDER WARRANTY OR CONTRACT SERVICE UNLESS THE CUSTOMER HAS INDICATED THAT HE WILL DEFINITELY NOT BE PURCHASING A SERVICE CONTRACT FROM DEC.

TK-6102



NOTE 1
THE REMOTE DIAGNOSTIC MODULE OR KIT IS THE PROPERTY OF DEC F.S.

TK-6101



NOTE 4

IF THIS INSTALLATION IS DONE BY DIGITAL FIELD SERVICE, SOFTWARE SERVICES PERFORMS THE SOFTWARE INSTALLATION.

IF THE PERSON INSTALLING THE SOFTWARE PERFORMS HIS OWN DSC COPY FROM THE VMS DISTRIBUTION KIT ONTO THE SAME PACK USED DURING THE INSTALLATION, THE DIAGNOSTIC INSTALLATION MUST BE REDONE.

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CHAPTER 1

INTRODUCTION

1.1 MANUAL SCOPE

This manual provides instructions for installing and accepting the VAX-11/750 computer system. These procedures have been developed for use by DIGITAL field service engineers and/or user personnel. The manual lists the steps that must be taken, following equipment delivery, in preparation for final acceptance by the customer.

The unpacking and pre-installation procedures are designed to ensure that the shipped VAX-11/750 system is the one actually ordered by the customer, and that the appropriate hardware, software and documentation for that system are present, accounted for, and at the current revision level.

NOTE

The entire VAX-11/750 system and appropriate documentation should be on hand before installation is begun. Any discrepancies must be noted and dealt with. It is difficult to collect on damages once equipment has been unpacked.

1.2 RELATED DOCUMENTS

Table 1-1 is a list of related hardware manuals.

Table 1-1 Related Manuals

Title	Document Number
VAX-11/750 Diagnostic System Overview Manual	EK-VXC750-UG
VAX-11 Diagnostic System User's Guide	EK-VX11D-UG
VAX-11/750 Central Processor Unit Technical Description	EK-KA750-TD
VAX-11/750 UNIBUS Interface Technical Description	EK-UI750-TD
VAX-11/750 Memory System Technical Description	EK-MS750-TD
VAX-11/750 Power System Technical Description	EK-PS750-TD
RH750 MASSBUS Adapter Technical Description	EK-RH750-TD
Microdiagnostic Mini Reference Guide	EK-KC750-RM-001
FP750 Floating-Point Accelerator Technical Description	EK-FP750-TD

The above manuals are available in the microfiche library. Hardcopy documents may be ordered from:

Digital Equipment Corporation
444 Whitney Street
Northboro, MA 01532
Attention: Printing and Circulation Services (NR2/M15)
Customer Services Section

CHAPTER 2

HANDLING THE PACKAGED EQUIPMENT

2.1 GENERAL

DIGITAL ships the various parts of the VAX-11/750 system in crates and boxes. Some of the equipment is mounted on skids as well. The customer is responsible for moving the packaged equipment to the installation site.

This chapter discusses the equipment packaging and the appropriate ways to transport the equipment from the receiving area to the installation area.

2.2 BOXED EQUIPMENT

All VAX-11/750 system cabinets and some large peripheral devices are mounted on casters. Other peripheral devices are mounted separately on skids or packed in consolidated boxes and attached to skids by hold-down rails. Fork lifts and mobile lifters can be used to move the packaged equipment.

If the consolidated boxes contain more than one item that cannot be moved to the installation area, they must be opened so that the small box contents can be moved separately.

2.3 CONSTRAINTS ON MOVING EQUIPMENT

The moving of cabinets from the receiving area to the installation area should be planned in advance of the delivery date. Ensure that the sizes of doors, elevators, passageways, and ramps are checked for height, width, and turning radius.

When moving the equipment, take the following precautions.

1. Move the cabinets carefully. They may become unstable when tilted more than 10 degrees from the vertical. If the cabinets are moved up ramps, additional precautions may be necessary.
2. Avoid jolting the cabinets.
3. Observe the caution symbols printed on the cabinet containers. When the cabinets are moved, they should be pushed on the side indicated. Two of the four casters on each cabinet are locked to facilitate movement in one direction.
4. The cabinets are mounted on shock-isolating casters. Normally, the cabinets will arrive with skids. If a fork lift is used, the prongs should be inserted from the front or the back of a double-width cabinet, or from the end of a single-width cabinet.
5. If the installation site is on an upper level, a crane or an elevator capable of lifting up to 2000 pounds should be used.

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CHAPTER 3

CPU HARDWARE

3.1 GENERAL

This chapter provides a step-by-step procedure for shipment inventory, unpacking, LA38 installation, configuring the bootstrap ROMs, and preparing the CPU so that power can be applied to it.

3.2 SHIPMENT INVENTORY

1. Check that all VAX-11/750 equipment has been moved to the designated installation site (a customer responsibility).
2. Inventory all equipment against the shipping list accompanying the shipment.
3. Ensure that all system cabinets and free-standing peripherals are in the containers and unopened.
4. Ensure that all separate and consolidated boxes are sealed.
5. Any opened packages or cabinets should be called to the attention of the customer and documented on the LARS report.
6. Notify the unit manager of any missing or incorrect items.
7. Have the customer contact the carrier to locate any missing items.
8. Have the unit manager check with the DIGITAL Traffic and Shipping Department if the carrier does not have the missing items.
9. Check all the boxes for external damage (dents, holes, smashed corners).
10. Notify the customer of all damage and list on the LARS report. Photographs are useful in clarifying the extent of the damage.

3.3 UNPACKING BOXES

1. Locate the “Open Me First” box.
2. Open all boxes and inventory the contents against the shipping/accessory list in the “Open Me First” box.
3. Inspect the equipment for damage. Report any damage to the customer and on the LARS report.
4. If the damage is extensive, call your unit manager for instructions on how to proceed.

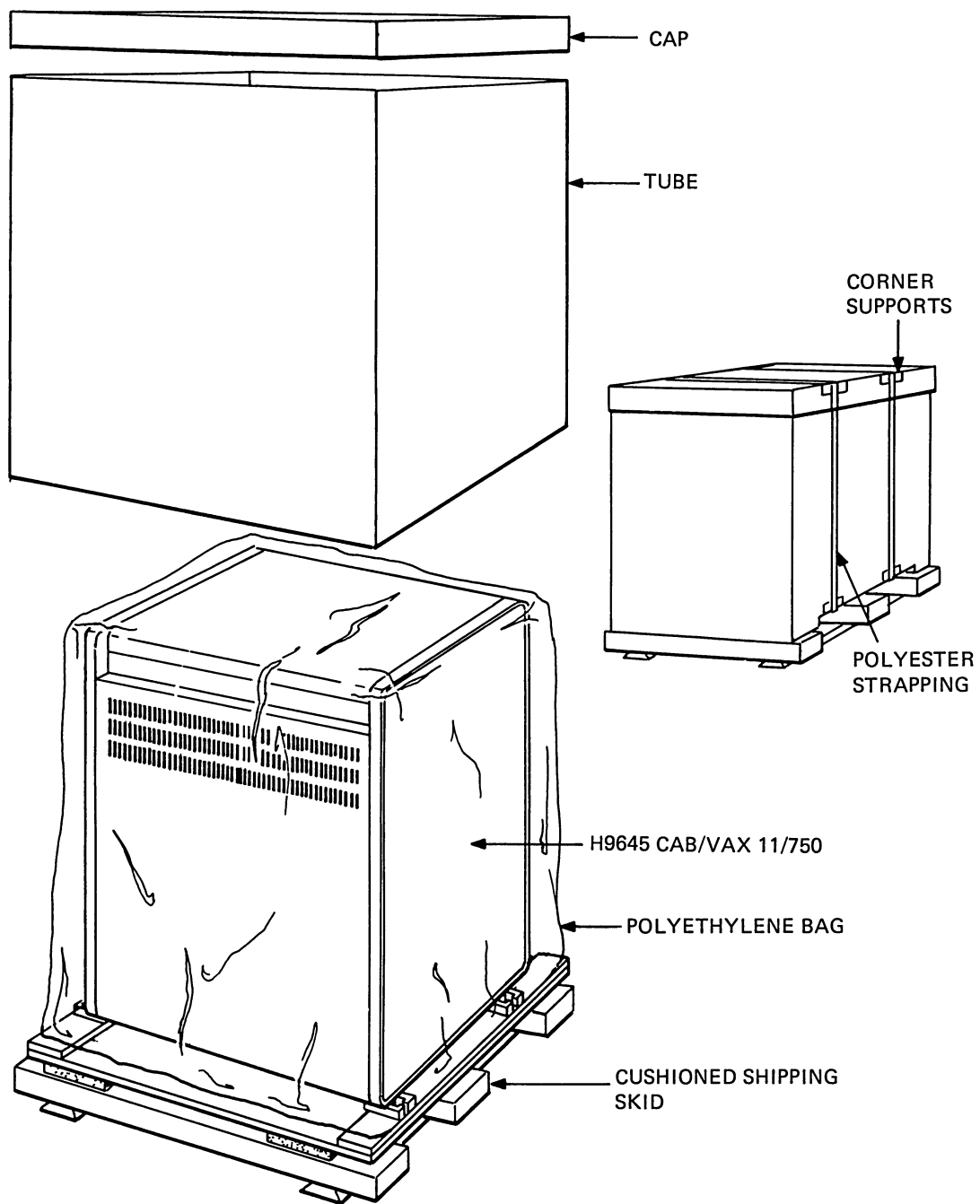
3.4 UNPACKING THE CPU CABINET

The following are necessary tools to unpack the CPU cabinet:

- 9/16 inch open end wrench
- ratchet handle
- 9/16 inch socket
- 3/4 inch socket
- knife or other tool to cut polyester strapping

Refer to Figure 3-1, and unpack the CPU cabinet as follows:

1. Cut the two polyester straps.
2. Remove cap from packaging container.
3. Lift up and remove stitched tube.
4. Remove polyethylene bag that encloses cabinet.
5. Remove the four blocks and the two spreaders from the cushioned shipping skid by using a 9/16 inch socket and ratchet.
6. Remove the four red shipping brackets using the 3/4 inch socket and ratchet. Save the washers to be used when the four leveling feet are installed.
7. Remove cabinet from skid deck; use a ramp if one is provided.
8. Locate the small reclosable (zip loc) poly bag that contains four leveling feet and four hex nuts. This poly bag is normally located in the cabinet or attached to the skid.
9. Install the four leveling feet by using a 9/16 inch open end wrench. Use the leveling feet and hex nuts from the poly bag and the washers that were removed with the four red shipping brackets.

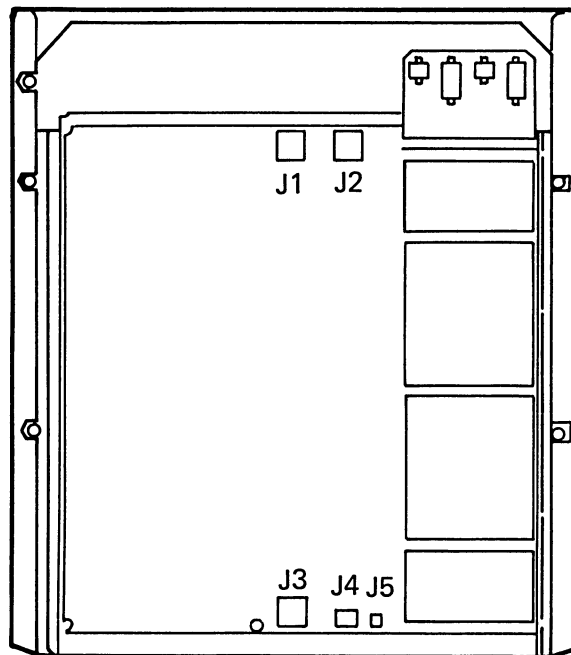


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Figure 3-1 Unpacking the CPU Cabinet

3.5 CPU PREPARATION

1. Move CPU cabinet to designated location.
2. Open front door with a 5/32 inch Allen wrench.
3. Remove ground strap that connects the front door to the chassis, and replace screw back into hole.
4. Unlatch front door and lift off.
5. Repeat above steps 2, 3, and 4 for the rear door.
6. Loosen card rack cover. Card rack cover is drilled so it can be lifted over the screws.
7. Loosen backplane cover. Backplane cover is drilled so it can be lifted over the screws.
8. Remove two screws from underneath back of top cover.
9. Remove top cover by lifting it up.
10. Screw the two top cover screws back into their holes for safekeeping.
11. Plug in the time-of-year (TOY) battery (red/black wire) into J5 of lower-right corner of the CPU backplane. (Figure 3-2).



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Figure 3-2 CPU Backplane

12. Remove main power cord from inside CPU cabinet.
 - Remove power supply screen by removing the two screws holding it.
 - Cut tie wraps on main power cord.
 - Lift main power cord out of CPU cabinet.
 - Reinstall power supply screen.
13. Inspect the CPU for properly seated modules, cables properly connected, etc.
14. Perform the following if the system is a MASSBUS system.
 - Remove the memory controller module from slot 10 of the CPU backplane.
 - Install the bootstrap ROMs (Paragraph 3.6).

3.6 BOOTSTRAP ROMS

The VAX-11/750 bootstrap ROMs are located on the memory controller module. The ROMs are plugged into sockets so that you can remove and/or relocate them. A UNIBUS disk system is operational without you altering the factory placement of the bootstrap ROMs (Table 3-1).

When installing a MASSBUS disk system, you need to install a MASSBUS disk bootstrap ROM on the memory controller module. You may plug this MASSBUS disk ROM in either the location that corresponds to switch position D, or you can rearrange the bootstrap ROMs to a customer-preferred boot switch position configuration. The only requirement is that the TU58 bootstrap ROM remain on the memory controller module, preferably in either socket position A or D (Figure 3-3).

Table 3-1 Factory Placement of the Bootstrap ROMs

Boot Switch Position	Device Type
A	TU58
B	RL02
C	RK07
D	EMPTY

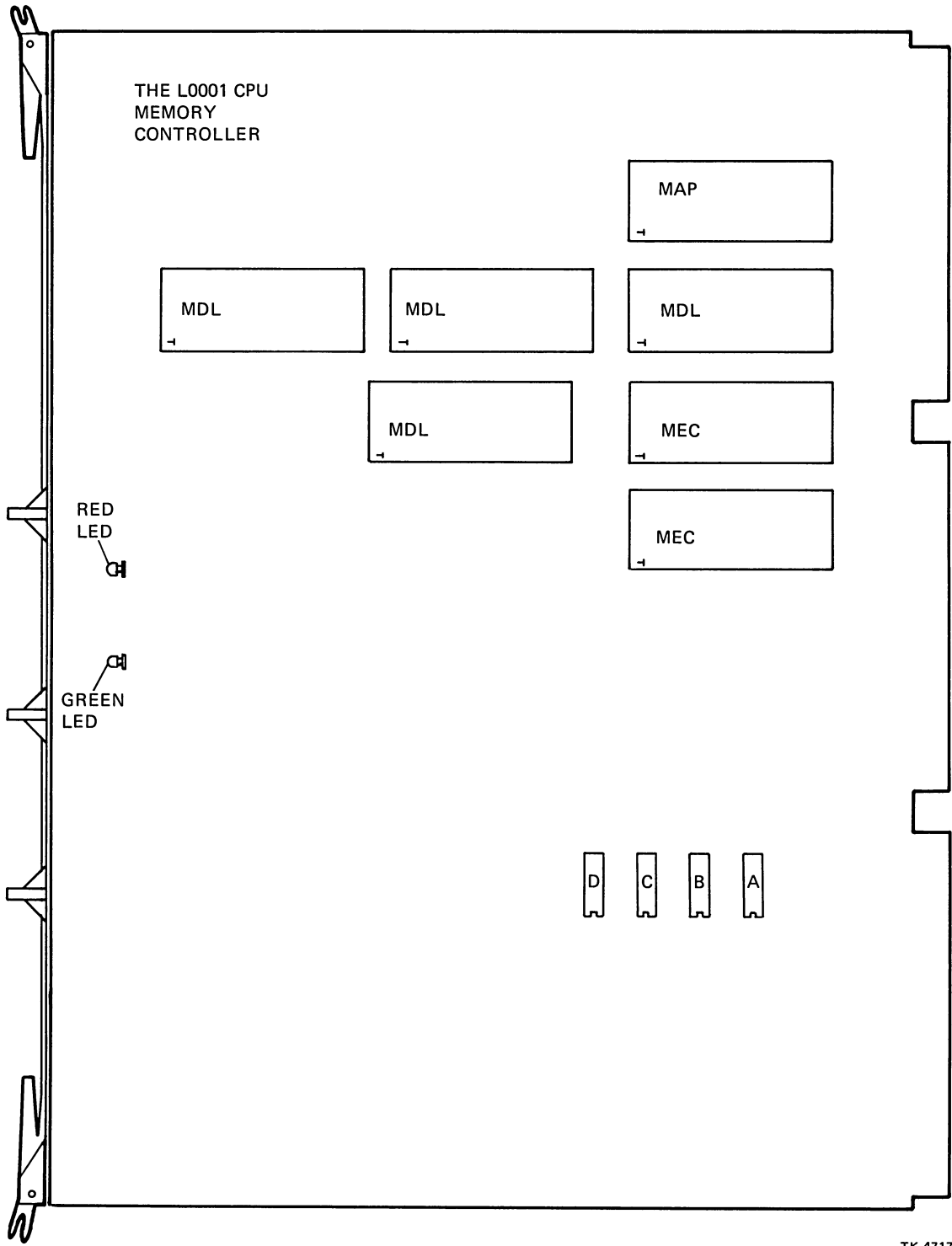


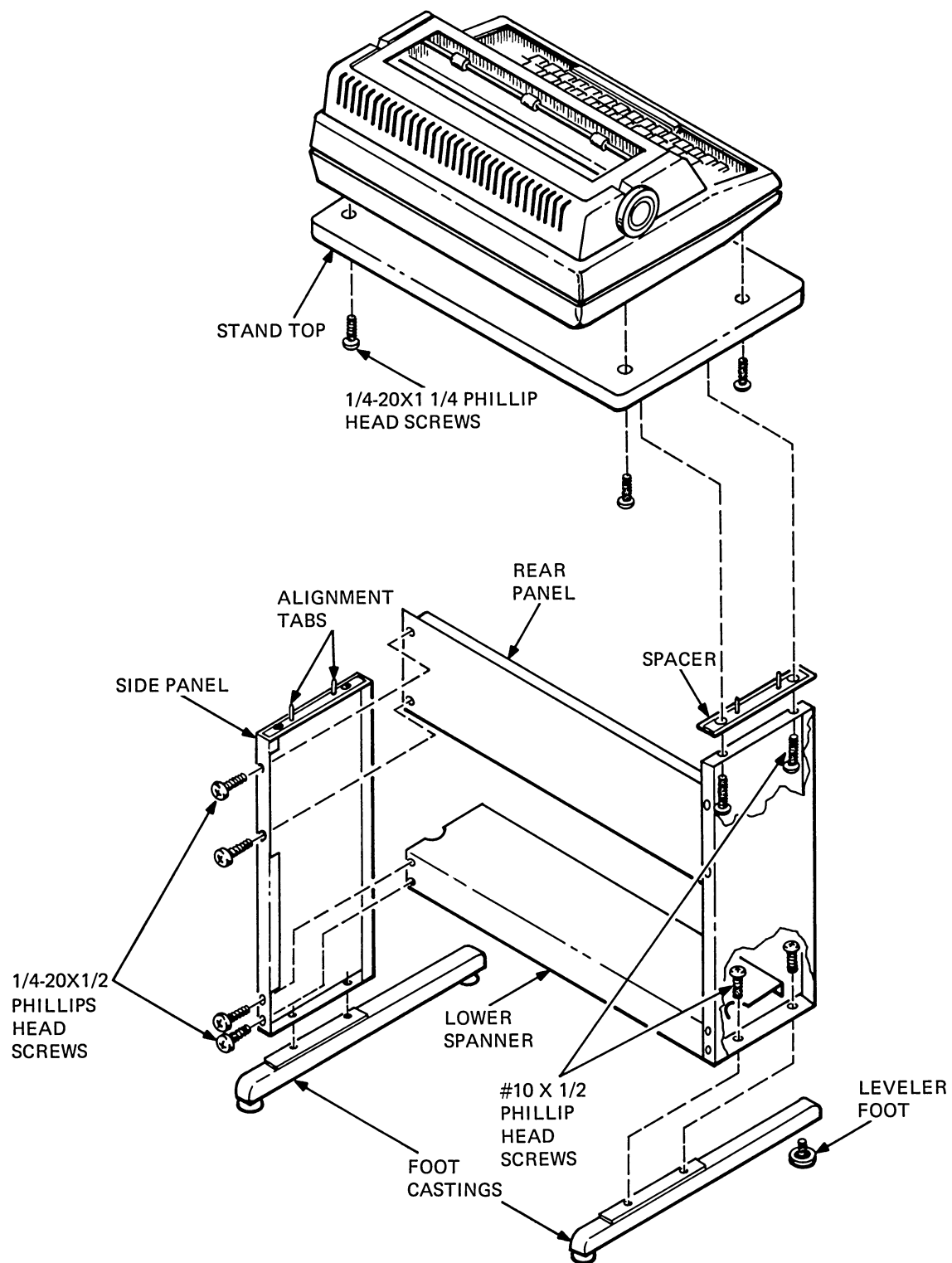
Figure 3-3 Bootstrap ROM Locations

3.7 INSTALLING LA38

The LA38 is a LA34 that is mounted on a LAX34-SA printer stand. The LAX34-SA must be assembled, and the LA34 mounted on the printer stand.

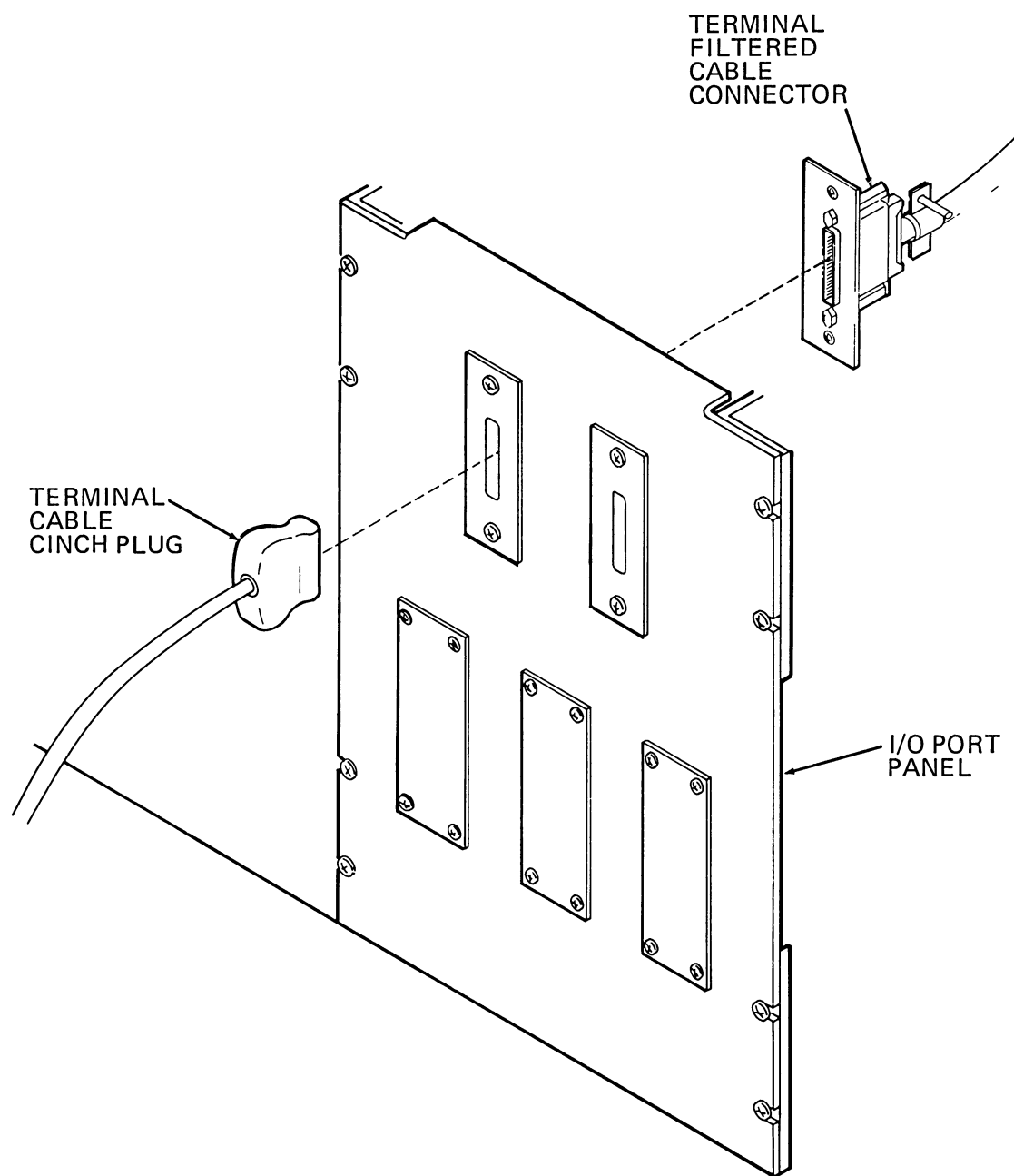
3.7.1 Unpacking and Assembling the LAX34-SA

1. Open shipping carton and remove printer stand option from packing material.
2. Inspect stand for damaged or missing parts. The parts contained in the LAX34-SA printer stand option are listed in Table 3-2. Report any damaged or missing parts to the local carrier and your DIGITAL branch office.
3. Secure lower spanner to side panels using 4 (1/4-20 \times 1/2) Phillips head screws (Figure 3-4).
4. Fit rear panel into slots in side panels and secure using 4 (1/4-20 \times 1/2) Phillips head screws.
5. Secure leveling feet to foot castings.
6. Secure foot castings to side panels using the 4 (10 \times 1/2) Phillips head screws.
7. Place the stand top top-down on a protective surface and insert alignment tabs on the spacers into holes in the stand top.
8. Place the frame assembly on the stand top and secure using 4 (10 \times 1/2) Phillips head screws.
9. Place the stand assembly in an upright position.
10. Unpack and install the LA34 as outlined in the *LA34 User's Guide* (EK-OLA34-UG-CN1).
11. Secure the printer (LA34) to the stand using 4 (1/4 20 \times 1-1/4) Phillips head screws.
12. Connect the EIA signal cable from the LA34 to J1 of the VAX-11/750 I/O connector panel (Figure 3-5).
13. Plug the LA34 power cable into a proper ac power source.



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Figure 3-4 LAX34-SA Printer Stand Assembly



TK-5988

Figure 3-5 I/O Connector Panel

Table 3-2 LAX34-SA Stand Parts List

Description	Part No.	Quantity
Side Panels	742351300-01	2
Lower Spanner	7423515-00	1
Rear Panel	7423514-00	1
Stand Top	3416599	1
Spacer	1216267-00	2
Foot Casting	1216268-02	2
Leveler Feet	9009685-00	4
1/4 20 × 1/2 Phillips Head Screws	9000040-02	8
#10 × 1/2 Phillips Head Screws	9010242-00	8
1/4 20 × 1-1/4 Phillips Head Screws	9006061-03	4

CHAPTER 4 CPU OPERATION

4.1 GENERAL

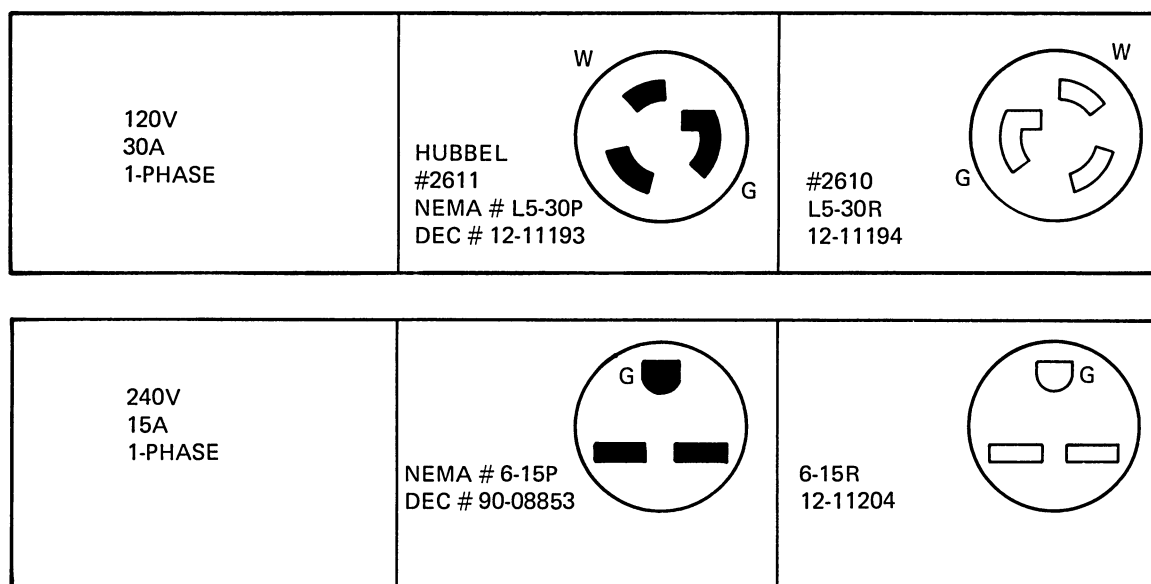
This chapter explains how to apply main power to the CPU and also how to use the TU58 diagnostics to verify the integrity of the CPU. Also, this chapter contains information on using the ac power controller panel, the CPU front control panel, the console commands, and the micro verify test.

4.2 APPLYING AC POWER TO THE CPU

Check the ac power receptacle to ensure that the external ac input voltage meets the specifications listed in Table 4-1. Figure 4-1 shows VAX-11/750's receptacles and power plugs.

Table 4-1 CPU Cabinet (H9645) AC Power Requirements

Single Phase	Nominal	Minimum	Maximum
Vac (RMS)	120	90	128
Phase to neutral	120	90	128
Phase to ground	120	90	128
Neutral to ground	N/A	N/A	N/A
Hz	60	47	63
Hz	50	47	63
Current in amperes			25 A at 90 Vac rms
Vac (RMS)	240	180	256
Phase to neutral	240	180	256
Phase to ground	N/A	N/A	N/A
Neutral to ground	N/A	N/A	N/A
Hz	60	47	63
Hz	50	47	63
Current in amperes			12.5 A at 180 Vac



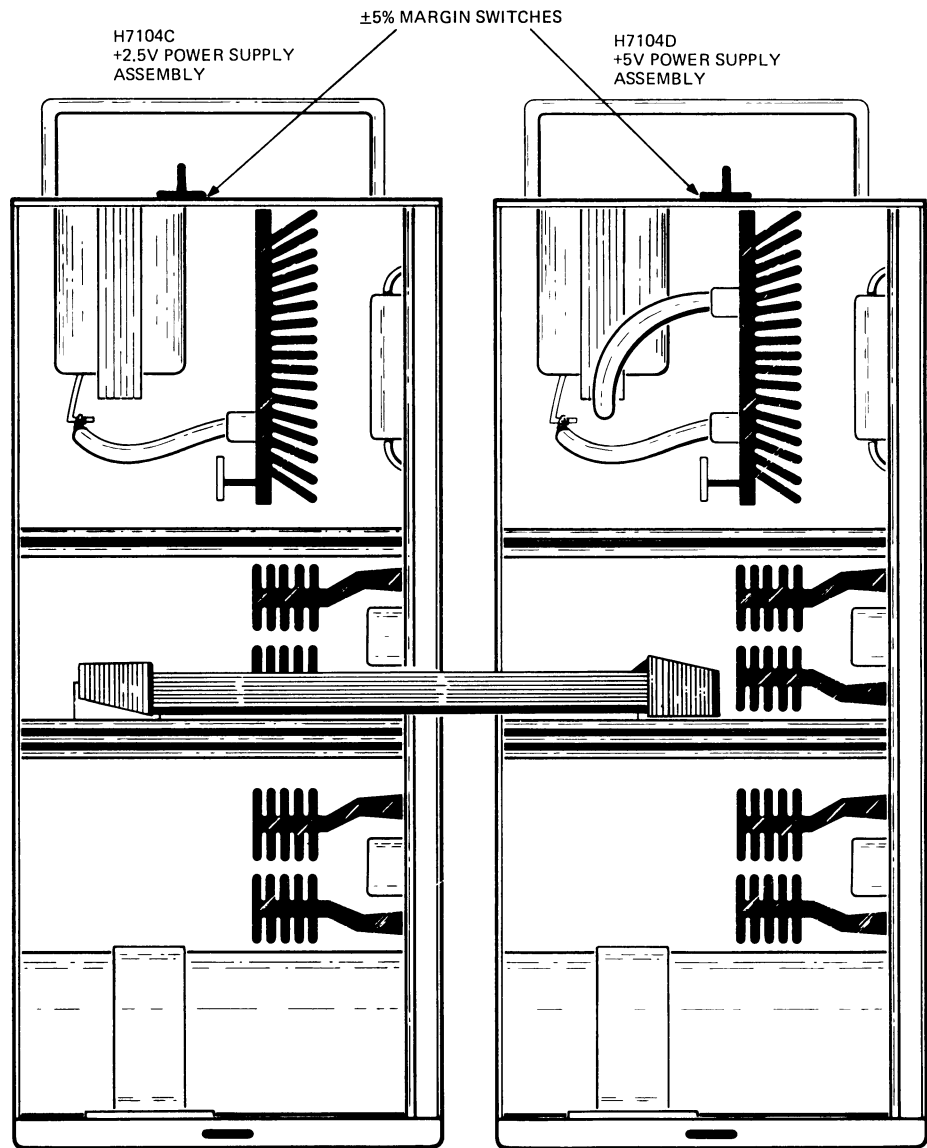
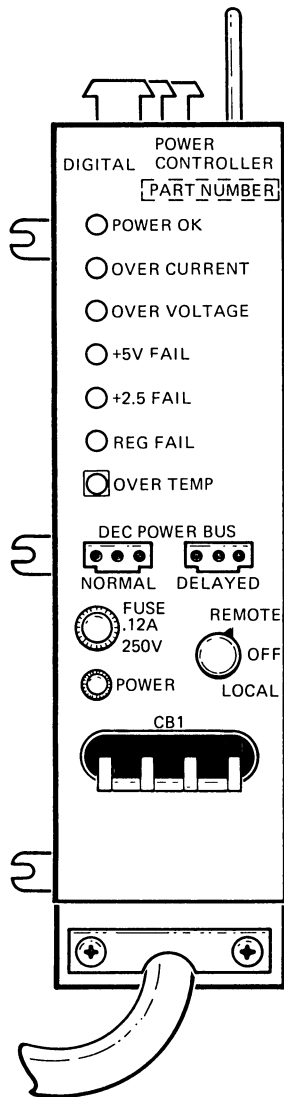
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Figure 4-1 VAX-11/750 Power Plugs and Receptacles

Do the following to properly apply ac power to the CPU.

1. Ensure that CPU power supply system's main circuit breaker CB1 on the ac power controller panel is off (down) as in Figure 4-2.
2. Verify that the two ± 5 percent margin switches on the power supply are in the straight up, center position (Figure 4-2).
3. Place the switch on the ac power controller panel to the remote position. The CPU's front panel key lock switch should be placed in the off position.
4. Connect the CPU's ac power cable to the external ac power source. The power phase indicator on the ac power controller should now be on.
5. Place the CB1 circuit breaker to the on position (up) as in Figure 4-2.
6. Now power can be applied to the CPU by the key lock switch on the CPU's front panel.

875 POWER CONTROLLER



TK-6432

Figure 4-2 VAX-11/750 Power Supply

4.3 AC POWER CONTROLLER PANEL

The ac power controller panel consists of eight indicators, one circuit breaker, one remote-local switch, one 12 A fuse, and two DIGITAL power bus connectors.

Indicator	Definition
DC OK	When the power supply system is functioning correctly, the green DC OK indicator is on. This indicator is never on if any power supply system fault indicator is on.
OVERVOLTAGE	Whenever the red overvoltage indicator is on, there is an overvoltage condition in either the +2.5 V or +5 V power supply. The affected power supply is indicated by its fail indicator being on.
OVERCURRENT	Whenever the red overcurrent indicator is on, there is an overcurrent condition in either the +2.5 V or +5 V power supply. The affected power supply is indicated by its fail indicator being on.
+5 V FAIL	The red +5 V fail indicator is lit when there is a malfunction in the +5 V power supply.
+2.5 V FAIL	The red +2.5 V fail indicator is lit when there is a malfunction in the +2.5 V power supply.
REG FAIL	The red reg fail indicator is lit when either the ± 5 V, +12 V or ± 15 V regulators are malfunctioning.
OVER TEMP	The over temp indicator is lit when there is an overtemperature condition in either the +5 V or the +2.5 V power supply.
POWER	The power indicator is lit whenever the external ac voltage is applied to the power supply system, even if CB1 is off.

REMOTE-LOCAL Switch

REMOTE	In the remote position, the external ac voltage is applied to the power supply system by the keyswitch on the CPU's front panel.
OFF	No external ac power is applied to the power supply system.
LOCAL	The external ac power is applied to the power supply system regardless of the keyswitch position on the CPU's front panel.
CB1	This is the main circuit breaker that applies the external ac power to the power supply system.
DEC POWER BUS	There are two DIGITAL power bus connectors: normal and delayed. These connectors provide a POWER UP REQUEST signal that can be interconnected between the H875 power system and remote power systems. There is a half-second delay on the delayed DIGITAL power bus connector's output (J9).

4.4 CPU FRONT CONTROL PANEL AND INDICATORS

The front panel of the VAX-11/750 has four switches and seven indicator lights. The switches and their functions are outlined below.

4.4.1 Five-Position Keylock Switch

OFF	No power to the CPU, except for the time-of-year clock.
SECURE	Console mode activation (control P) is disabled. The optional remote diagnostics line is completely disabled, as is the INITIALIZE button.
LOCAL	The CPU responds to console commands, and the optional remote diagnostic line is completely disabled.
REMOTE	Only the remote line can activate the console functions, however, the remote line has the capability to relinquish control to the local terminal.
REMOTE/SECURE	The remote line replaces the local console terminal, and console mode activation and RDM diagnostic mode activation are inhibited. The remote line may place the local console terminal in “talk” mode.

4.4.2 Power On Action Switch

This four-position rotary switch selects the CPU action on power up and initialize.

RESTART/HALT	If the memory contents have been maintained by the battery backup unit, a restart sequence is attempted; otherwise, the CPU halts.
HALT	The CPU comes up in the halted state in the console I/O mode.
BOOT	The CPU bootstraps from the device selected by the BOOT DEVICE switch (Paragraph 4.4.3).
RESTART/BOOT	If the memory contents have been maintained by the battery backup unit, a restart is attempted; otherwise, a bootstrap sequence occurs.

4.4.3 Boot Device Switch

This four-position rotary switch selects a bootstrap ROM to boot a specific device. The VAX-11/750's memory controller contains four sockets for built-in, read-only memory chips that contain the VAX-11/750 code required to bootstrap a specific device. The BOOT DEVICE switch selects which one of the four ROMs is to provide the bootstrap code for an initiated boot sequence.

4.4.4 Initialize

This pushbutton switch activates a false CPU power down/power up sequence. First micro verify is performed and then the system comes up in the state selected by the POWER ON ACTION switch. Initialize is disabled in either of the secure positions.

4.4.5 CPU State Indicator Lights

POWER	This green light, when lit, indicates that DC power is applied to the CPU, and that the KEYLOCK switch is not in the OFF position.
RUN*	When lit, this green light indicates that the CPU is in the RUN state.
ERROR*	When lit, this red light indicates that the CPU has stopped because of an unrecoverable control store parity error.

*These indicators are not meaningful during microdiagnostics.

4.4.6 Remote Diagnostic Indicators

Four back-lit words (Remote D, RD Carrier, RD Test, and RD Fault) apply only to systems having the optional remote diagnostic module installed by field service. Refer to the *KC750 Microdiagnostic and Technical Manual* (EK-KC750-TM) for additional information on the remote diagnostic module. Also, the *VAX-11/750 Microdiagnostic Pocket Reference Guide* (EK-KC750-RM-001) contains summary information.

4.5 CONSOLE COMMANDS

Information on console commands can be found in the *VAX-11/750 Diagnostic System Overview Manual* (EK-VXD75-UG-PRE), *VAX Hardware Handbook* (EB-17281-20/80) or the *VAX-11/750 Microdiagnostic Packet Reference Guide* (EK-KC750-RM-001).

4.6 MICRO VERIFY TEST

The micro verify test verifies the integrity of the CPU hardware. Although it does not test the CPU thoroughly, this test does aid in identifying failures that prevent loading and executing of the hardware instruction test (EVKAA).

There are three ways to initiate the micro verify test.

1. The test runs automatically on a power up sequence or by pushing the INITIALIZE button.
2. It runs automatically whenever you type the boot command on the console, unless you prevent it by qualifying the boot command with the /X qualifier.
3. You can type the test command (T<CR>) and initiate the test in this way.

When the micro verify program begins to run, it types a percent sign (%) on the terminal. After micro verify runs successfully, it types a second percent sign (%). Example 4-1 shows the output for a successful micro verify run. The XXXXXXXX represents the PC.

Whenever micro verify detects a failure, a single error character is typed in place of the second percent sign, the processor halts in the console I/O mode, and a halt code PC is typed. The halt code indicates that a halt is due to an error condition in the micro verify test. Example 4-2 shows the console output for a micro verify failure.

```
>>>T                               ! Run micro verify and
                                     ! initialize.
%%                                  ! Successful test completion
XXXXXXXX 01
>>>                               ! Console prompt
```

Example 4-1 Successful Micro Verify Run

```

>>>T                ! Run micro verify and
                     ! initialize.
%E                  ! Scratch pad bit test
                     ! failure. Refer to Table 3-1 for
                     ! error code interpretation.
00000052  FF        ! Error clearing GPR
                     ! Console-halt following
                     ! micro verify.
>>>                ! Console input prompt

```

Example 4-2 Micro Verify Failure

4.7 BOOTSTRAPPING TU58 DIAGNOSTIC CASSETTES

Each TU58 diagnostic tape cassette containing its own boot block can be bootstrapped. After a bootable diagnostic cartridge is inserted into the TU58 slot in the CPU's front panel, you can bootstrap the diagnostic using one of the following methods.

4.7.1 Method 1

Place the POWER ON ACTION switch to the BOOT position. Set the BOOT DEVICE switch to the boot ROM position corresponding to the TU58.

Turn the keyswitch from OFF to the LOCAL position, or with the keyswitch already in the LOCAL position, press the INITIALIZE button.

4.7.2 Method 2

Place the POWER ON ACTION switch to the HALT position. Place the BOOT DEVICE switch to the BOOT position for the TU58.

Type B<CR> after a console prompt (>>>).

4.7.3 Method 3

Type the following:

B<space> DDA0<CR>

The BOOT DEVICE switch does not have to be selecting the bootstrap ROM for the TU58.

NOTE

If there is no console prompt (>>>), obtain one by typing CTRL/P on the console terminal, or press the initialize button with the power-on-action switch set to halt.

4.8 CPU DIAGNOSTICS (TU58)

To verify the integrity of the CPU at installation, the following diagnostics from the TU58 should be run in the order listed in Table 4-2.

Table 4-2 CPU Diagnostics (TU58)

Diagnostic	Area Tested	TU58 Cassette Number
EVKAA	Hardcore Instructions	7
ECKAL	Cache/TB	5
ECSAA	Diagnostic Supervisor	6
ECCBA	UBI/DW 750	6
EVKAB	Architectural Instructions	8
EVKAC	Floating-Point Instructions	8
EVKAD	Compatibility Mode Instructions	8
EVKAE	Privileged Architectural Instructions	8
ECKAX	Cluster Exerciser	5
ECKAM	Memory Diagnostic	5

4.9 CONFIGURATION FILES

Example 4-3 shows a typical configuration file. The title of this file must be CONFIG.COM. The TU58 diagnostic tapes do not initially contain configuration files. Thus, if you desire to have a configuration file on a TU58 diagnostic tape, you must create it yourself. Refer to the *VAX-11 Diagnostic System User's Guide* for the procedure to create a configuration file.

```

DS> @CONFIG
DS> ATTACH KA750 CMI KAO NO NO YES 0 0
DS> ATTACH DW750 CMI DWO
DS> ATTACH RL11 DWO DLA 774400 160 5
DS> ATTACH RL02 DLA DLA0
DS> ATTACH RL02 DLA DLA
DS> ATTACH RK611 DWO DMA 777440 210 5
DS> ATTACH RK07 DMA DMA0
DS> ATTACH RK07 DMA DMA1
DS> ATTACH RK07 DMA DMA2
DS> ATTACH LP11 DWO LPA 777514 200 4
DS> ATTACH LP05 LPA LPA0
DS> ATTACH DZ11 DWO TT1A 760100 300 5 EIA
DS> ATTACH VT52 TTA TTA0
DS> ATTACH VT52 TTA TTA1
DS> ATTACH VT52 TTA TTA2
DS> ATTACH VT52 TTA TTA3
DS> ATTACH VT52 TTA TTA4
DS> ATTACH VT52 TTA TTA5
DS> ATTACH VT52 TTA TTA6
DS> ATTACH VT52 TTA TTA7
DS> @ <EOF>

```

Example 4-3 Configuration File

4.10 RUNNING TU58 DIAGNOSTICS

The following is an example of a successful CPU diagnostics (TU58) run. The underlined portions are examples of what you, the operator, will type.

```
B DDAO  
%%
```

```
EVKAA-5.0 done!  
EVKAA-5.0 done!  
EVKAA-5.0 done!  
EVKAA-5.0 done!  
EVKAA-5.0 done!  
00008D9E 02  
>>>B DDAO  
%%
```

```
ECKAL-2.0 DONE!  
ECKAL-2.0 DONE!  
ECKAL-2.0 DONE!  
ECKAL-2.0 DONE!  
ECKAL-2.0 DONE!  
0000445C 02  
>>>B/10 DDAO  
%%
```

DIAGNOSTIC SUPERVISOR, ZZ-ECSAA-5.3-113 19-DEC-1980 09:23:55.31

```
DS> ATTACH KA750 CMI KAO  
G-floating instructions? NO  
H-floating instructions? NO  
Time-of-year clock? YES  
WCS last address? 0  
Accelerator type? 0  
DS> SELECT KAO  
DS> SET TRACE  
DS> RUN EVKAB
```

.. PROGRAM: VAX User Mode Kernel Instructions Exerciser, ZZ-EVKAB-X, REV 1.2, 8 TESTS, AT 09:27:59.33.
TESTING: _KAO

```
TEST 1: Integer Arithmetic and Logical Instructions  
TEST 2: Variable Length Bit Field Instructions  
TEST 3: Basic Branch Instructions  
TEST 4: Single Bit Field Control Instructions  
TEST 5: Integer Arithmetic Control Instructions  
TEST 6: INDEX Instruction  
TEST 7: Queue Instructions  
TEST 8: Character String Instructions, Trial  
.. END OF RUN. 0 ERRORS DETECTED. PASS COUNT: 1. TIME: 19-DEC-1980 09:29:13.61  
DS> RUN EVKAC
```

.. PROGRAM: VAX User Mode Subsettable Instructions Exerciser, ZZ-EVKAC-X, REV 0.0, 4 TESTS, AT 09:30:38.04.
TESTING: _KAO

```
TEST 1: Single Precision Floating Point Instructions  
TEST 2: Double Precision Floating Point Instructions  
TEST 3: Decimal String Instructions  
TEST 4: Edit Instruction  
.. END OF RUN. 0 ERRORS DETECTED. PASS COUNT: 1. TIME: 19-DEC-1980 09:31:09.14  
DS> RUN ECKAX/SEC:MANUAL
```

.. PROGRAM: VAX 11/750 Specific CPU Cluster Exerciser - ZZ-ECKAX-X, REV 0.1, 4 TESTS, AT 09:36:28.74.
TESTING: _KAO

```

TEST 1: TU58 EXERCISER DEFAULT
TEST 2: TU58 EXERCISER MANUAL
TEST 3: POWER FAIL (INIT SWITCH)
Good Restart Parameter Block test - This test will
restart itself if the RPB is properly interpreted.
Push the init switch to power fail...
%%

Bad Checksum Test - This test will halt the processor
with a halt code of 11. After this has happened the test
is restarted by typing S 100 <CR> on the console terminal.
Push the init switch to power fail...

%%

00000000 11
>>>S 100

Search for Good RPB - This test will restart itself
if the good RPB is found and interpreted properly.
Push the init switch to power fail...
%%

Warm Start Flag Test - This test will halt the processor
with a halt code of 12. After this has happened the test
is restarted by typing S 100 <CR> on the console terminal.
Push the init switch to power fail...

%%

00000000 12
>>>S 100

TEST 4: POWER FAIL (BREAKER)
Is this system equipped with a battery backup? [(NO), YES] NO

.. END OF RUN. 1 ERROR DETECTED. PASS COUNT: 1. TIME: 19-DEC-1980 09:49:00.80
DS> ST

.. PROGRAM: VAX 11/750 Specific CPU Cluster Exerciser - ZZ-ECKAX-X , REV 0.1, 4 TESTS, AT 09:49:50.43.
TESTING: _KA0

TEST 1: TU58 EXERCISER DEFAULT
.. END OF RUN. 0 ERRORS DETECTED. PASS COUNT: 1. TIME: 19-DEC-1980 09:50:06.11
DS> ST

.. PROGRAM: VAX 11/750 Specific CPU Cluster Exerciser - ZZ-ECKAX-X , REV 0.1, 4 TESTS, AT 09:50:33.40.
TESTING: _KA0

TEST 1: TU58 EXERCISER DEFAULT
.. END OF RUN. 0 ERRORS DETECTED. PASS COUNT: 1. TIME: 19-DEC-1980 09:50:42.83

```

```

DS> SET TRACE
DS> RUN ECKAM

.. PROGRAM: ECKAM-0.9      VAX 11/750 MEMORY DIAGNOSTIC, REV 0.9, 11 TESTS, AT 09:53:08.06.

HIGHEST LONGWORD ADDRESS IS: 000BFFFC(X).
TEST 1: MEMORY MAP VERIFICATION TEST
MEMORY MAP VALID: 0000003F(X)
SLOT00 IS FULLY POPULATED (256KB)
SLOT01 IS FULLY POPULATED (256KB)
SLOT02 IS FULLY POPULATED (256KB)
SLOT03 IS EMPTY
SLOT04 IS EMPTY
SLOT05 IS EMPTY
SLOT06 IS EMPTY
SLOT07 IS EMPTY
TEST 2: DATA BUS TEST
TEST 3: ROW SELECT BUS TEST
TEST 4: ADDRESS BUS TEST
TEST 5: ECC LOGIC TEST
TEST 6: CSRO TEST
TEST 7: BOOTSTRAP ROM TEST
ROM NUMBER: A  DEVICE TYPE: DM
ROM NUMBER: B  DEVICE TYPE: DL
ROM NUMBER: D  DEVICE TYPE: DD
TEST 8: CPU LOST ERROR TEST
TEST 9: CPU XB ERROR BIT TEST
TEST 10: MOVING INVERSIONS TEST
ARRAY01 SINGLE BIT ERRORS:
  ROW 0 - 0
  ROW 1 - 0
  ROW 2 - 0
  ROW 3 - 0
ARRAY02 SINGLE BIT ERRORS:
  ROW 0 - 0
  ROW 1 - 0
  ROW 2 - 0
  ROW 3 - 0
NUMBER OF CORRECTABLE ERRORS = 1

ADDRESS (PAGE)      SYNDROME
-----
00000000(X)         00(X)
00040800(X)         6E(X)

.. END OF RUN.  0 ERRORS DETECTED.  PASS COUNT: 1.  TIME: 19-DEC-1980 09:59:41.42
DS> @CONFIG
DS> ATTACH KA750 CHI KAO NO NO YES 0 0
DS> ATTACH TU58 KAO CS1
DS> ATTACH DW750 CHI DW0
DS> ATTACH RL11 DW0 DLA 774400 160 5
DS> ATTACH RL02 DLA DLA0
DS> ATTACH RL02 DLA DLA1
DS> ATTACH LP11 DW0 LPA 777514 200 4
DS> ATTACH LA180 LPA LPA0
DS> ATTACH DMC11 DW0 XMA 760070 300 5
DS> ATTACH DZ11 DW0 TTA 760110 310 5 EIA
DS> ATTACH VT100 TTA TTA1
DS> ATTACH VT100 TTA TTA2
DS> ATTACH VT100 TTA TTA3
DS> ATTACH VT100 TTA TTA4
DS> ATTACH VT100 TTA TTA5
DS> ATTACH VT100 TTA TTA6
DS> ATTACH VT100 TTA TTA7
DS> !

```

DS> @ <EOF>
DS> SET TRACE

DS> SELECT KA0,DW0
DS> RUN ECCBA

.. PROGRAM: ECCBA-REV. 0.14 VAX 11/750 UBI Diagnostic, REV 0.14, 30 TESTS, AT 10:02:09.06.
TESTING: _DW0

TEST 1: Control and Status Register Test
TEST 2: Map Data Bus Test
TEST 3: Map Chip Select Test
TEST 4: Map Address Bus Test
TEST 5: Map Entry Test
TEST 6: CPU Read/Write Test
TEST 7: CMI to Unibus Addressing Test
TEST 8: Unibus to CMI Addressing Test
TEST 9: Data Path Select Test
TEST 10: Direct Data Path DATI Test
TEST 11: Direct Data Path DATIP/DATO Test
TEST 12: Direct Data Path DATOB Test
TEST 13: Buffered Address Register Test
TEST 14: Buffered Data Path DATI Test
TEST 15: Buffered Data Path DATIP Test
TEST 16: Buffered Data Path DATO Test
TEST 17: Buffered Data Path DATOB Test
TEST 18: Buffered Data Path Autopurse Test
TEST 19: Byte Offset DATI Test
TEST 20: Byte Offset DATIP/DATO Test
TEST 21: Byte Offset DDP DATO Test
TEST 22: Byte Offset BDP DATO Test
TEST 23: Byte Offset DDP DATOB Test
TEST 24: Byte Offset BDP DATOB Test
TEST 25: Map Entry Functional Test
TEST 26: CSR Status Bit Test
TEST 27: Interrupt Test
TEST 28: Map Invalid Test
TEST 29: UET PB Bit Test
.. END OF RUN. 0 ERRORS DETECTED. PASS COUNT: 1. TIME: 19-DEC-1980 10:04:38.50
DS>

CHAPTER 5

SYSTEM HARDWARE CONFIGURATION

5.1 GENERAL

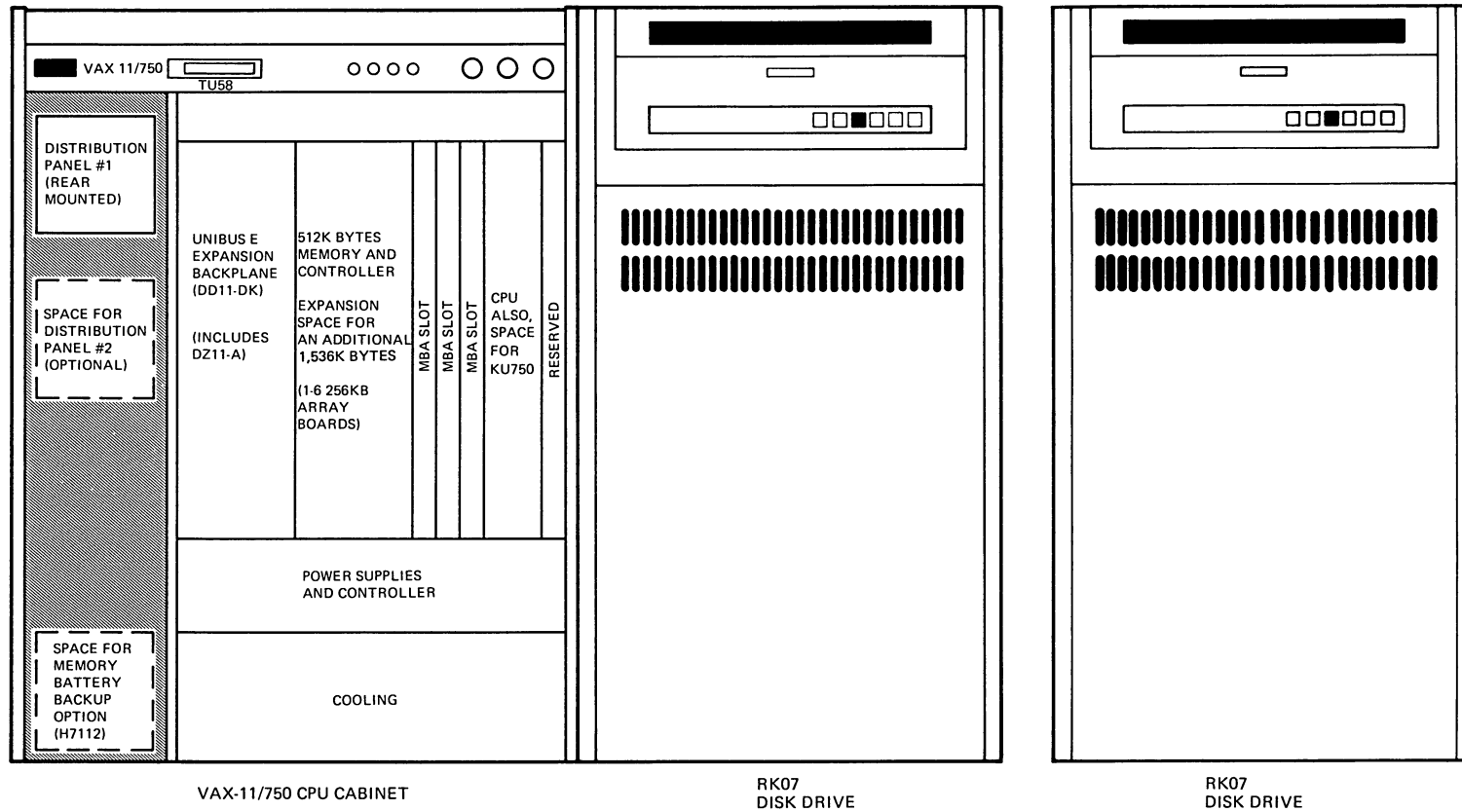
This chapter contains VAX-11/750 system cabinet configuration guidelines, an example installation procedure for a dual RK07 disk system with a TS11 magtape, UNIBUS cabling procedure and RH750 installation procedure.

Since there are numerous possible VAX-11/750 system configurations, it is impractical to present all of them in this one chapter. Using the information in this chapter and the manufacturing configuration sheet shipped with the system, one should be able to configure any VAX-11/750 system. Figures 5-1 through 5-3 illustrate three typical system configurations.

5.2 VAX-11/750 SYSTEM CABINET CONFIGURATION GUIDELINES

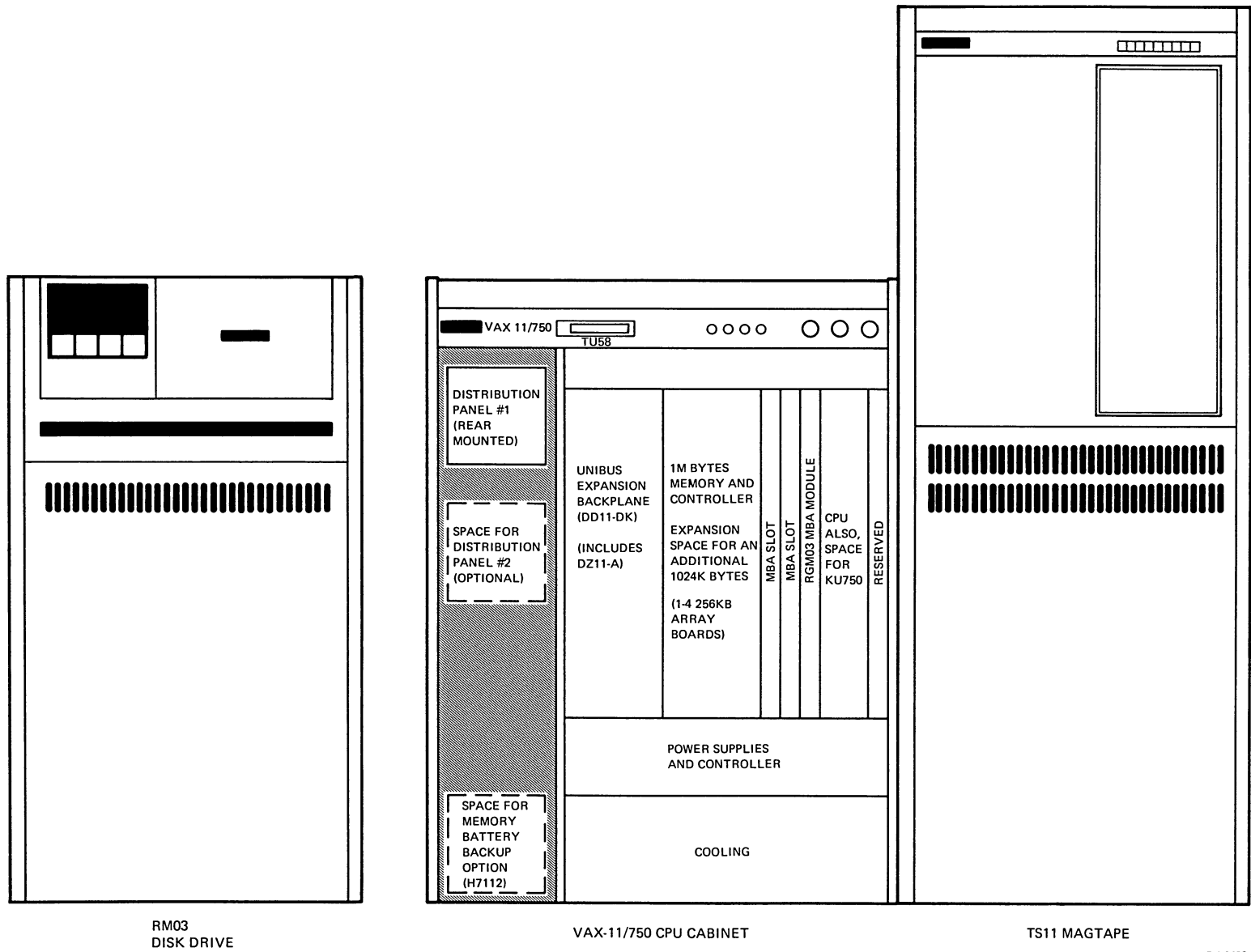
When installing a VAX-11/750 system, observe the following guidelines on cabinet placement and system configuration.

1. The VAX-11/750 CPU cabinet is always the leftmost cabinet in the string of physically joined cabinets.
2. TS11 magtape units, when present, are always in the rightmost position(s) and are physically joined to the other system cabinets.
3. In the dual RK07 packaged systems, only the first RK07 cabinet (the one with the BA11-LE mounted in it) is physically joined in the system cabinet string. The second RK07 and any other additional disk drives (any variety) are to be freestanding. The BA11-LE in the first RK07 cabinet is a dedicated box, thus, no add-on options are to be installed in the RK711 backplane.
4. In systems which include an expander cabinet, the expander cabinet is to be physically joined in the string of cabinets. To determine cabinet placement relative to the RK07/RK711 cabinet, consider the nature of the options contained in the expander cabinet (i.e., NPR vs. program I/O, bandwidth).



TK-6435

Figure 5-1 Dual RK07 VAX-11/750



TK-6433

Figure 5-2 RM03/TS11 VAX-11/750

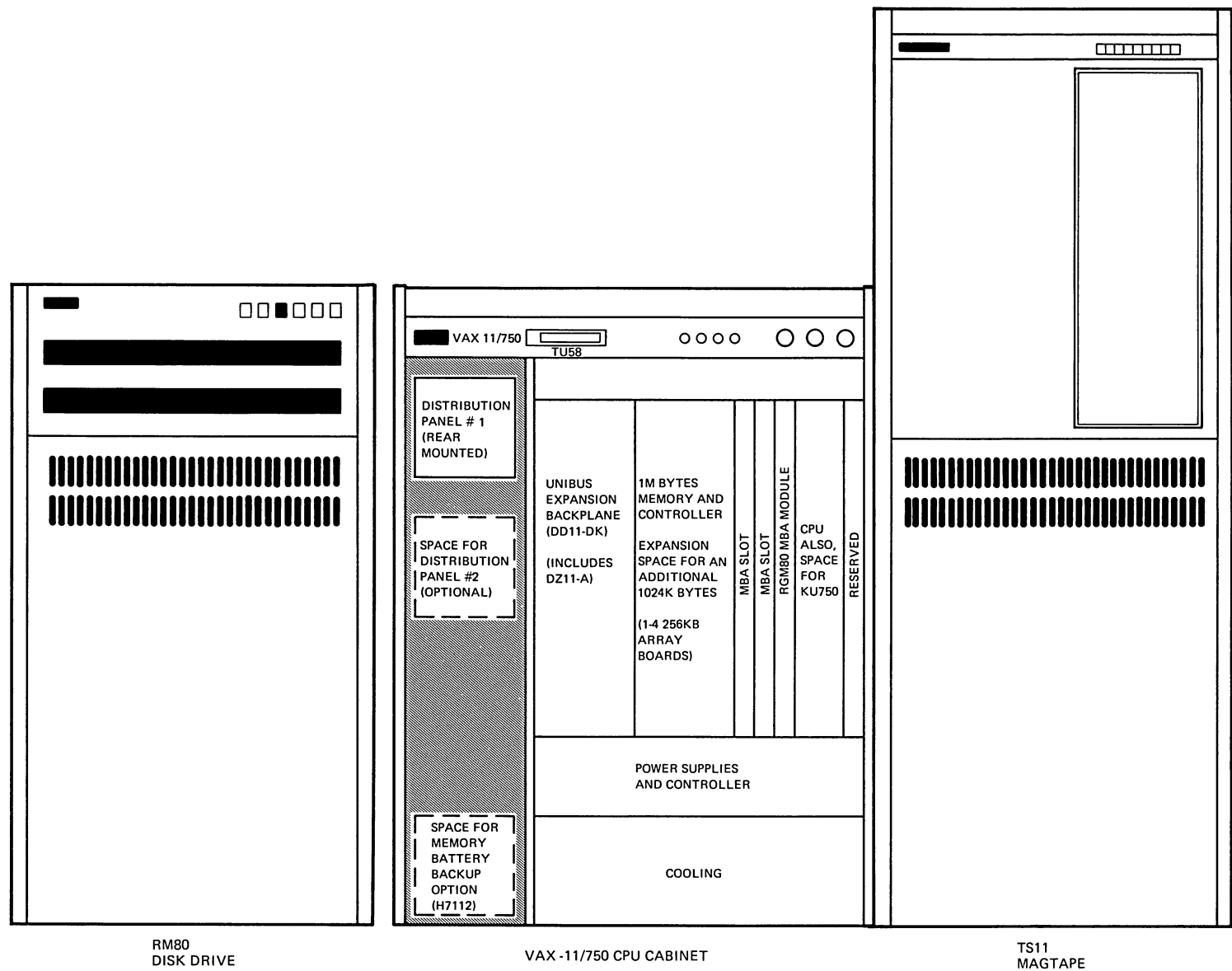


Figure 5-3 RM80/TS11 VAX-11/750

5.3 DUAL RK07 DISK PACKAGED SYSTEM WITH A TS11 MAGTAPE

A dual RK07 disk packaged system with a TS11 magtape is set up as follows:

1. Move the cabinets into the installation area.
2. Remove the following if not already removed.
 - front door (Figure 5-4)
 - rear door (same procedure as Figure 5-4)
 - right CPU panel (Figure 5-5)
 - top cover (Paragraph 3.5, Steps 8 and 9)
3. Install all the cabinet stabilizing feet prior to joining the cabinets. These stabilizing feet are normally shipped in a plastic bag in the bottom of each cabinet. Refer to Figure 5-6 for the stabilizing feet installation procedure.
4. Move the RK07/RK711 cabinet into position to the right of the CPU cabinet and secure the two cabinets as illustrated in Figures 5-7 through 5-9.

NOTE

TS11 cabinets for the VAX-11/750 are shipped with the expander/transition panel on the right side and the full panel on the left side. To configure the TS11 cabinet for the VAX-11/750 system, the left side panel must be exchanged with the right panel (Steps 5 through 7).

5. Remove the left side panel from the TS11 cabinet (Figure 5-10).
6. Remove the expander/transition panel from the right side of the TS11 and place it on the left side of the TS11.
7. Place the removed left side TS11 panel on the right side of the TS11 cabinet.
8. Join the TS11 and the RK07/RK711 cabinets and secure them as the CPU and RK07/RK711 cabinets were secured (Figures 5-7 through 5-9).
9. Position the second RK07 drive right of the TS11 so that it is freestanding. Refer to Figure 5-11.
10. Adjust the leveler feet on all the cabinets so the cabinets are secure and level. Refer to Figure 5-12.

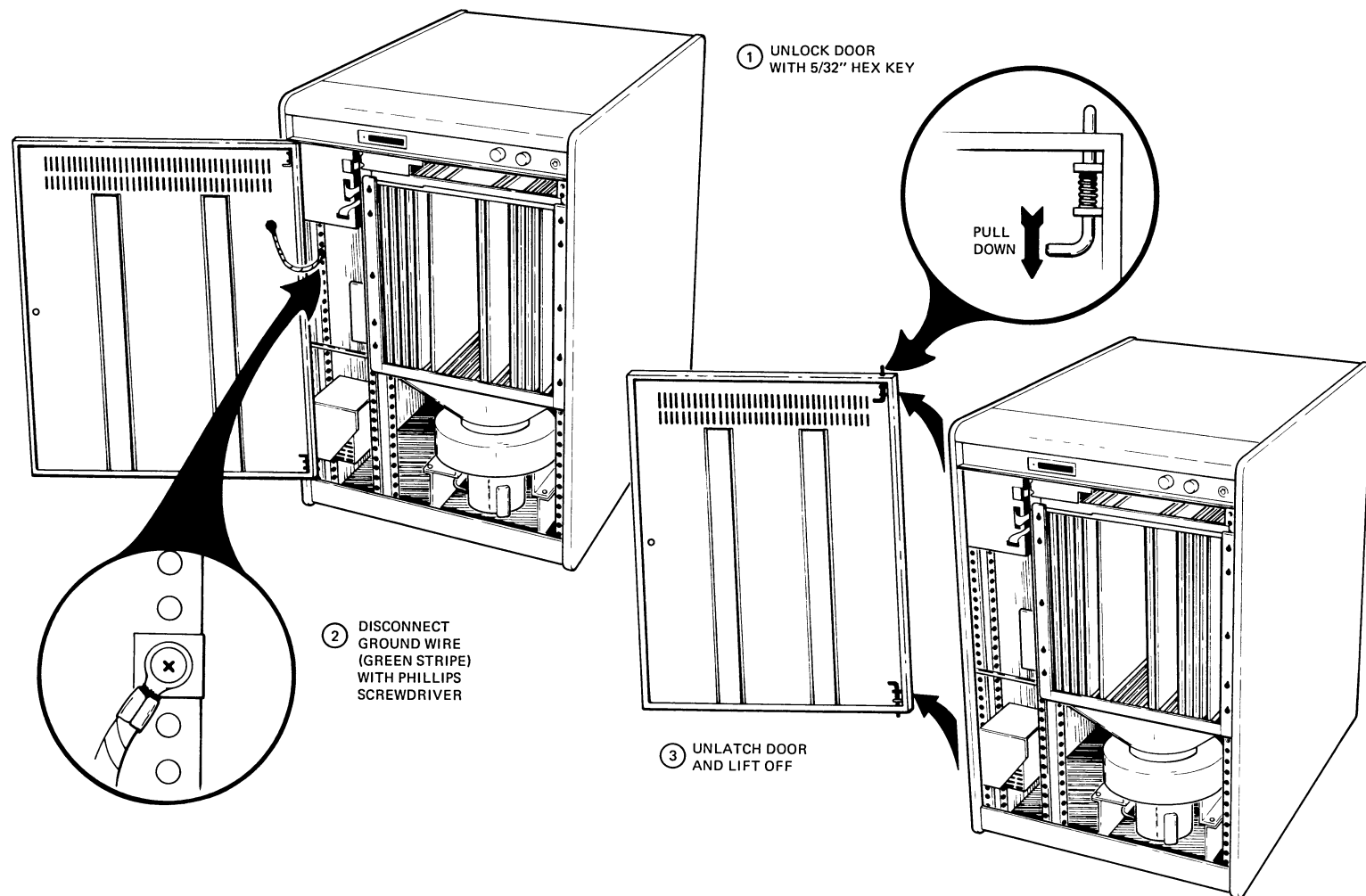
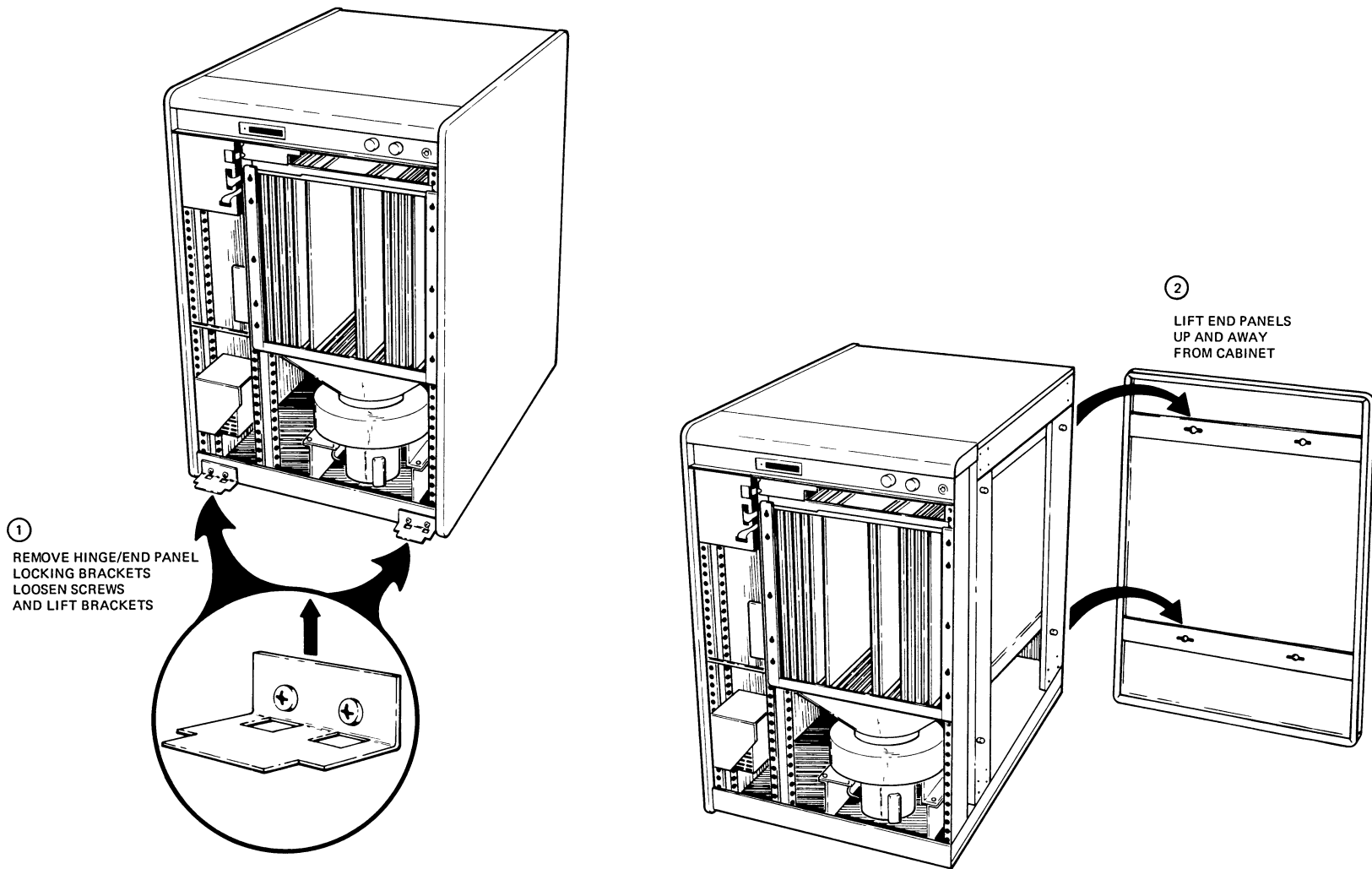
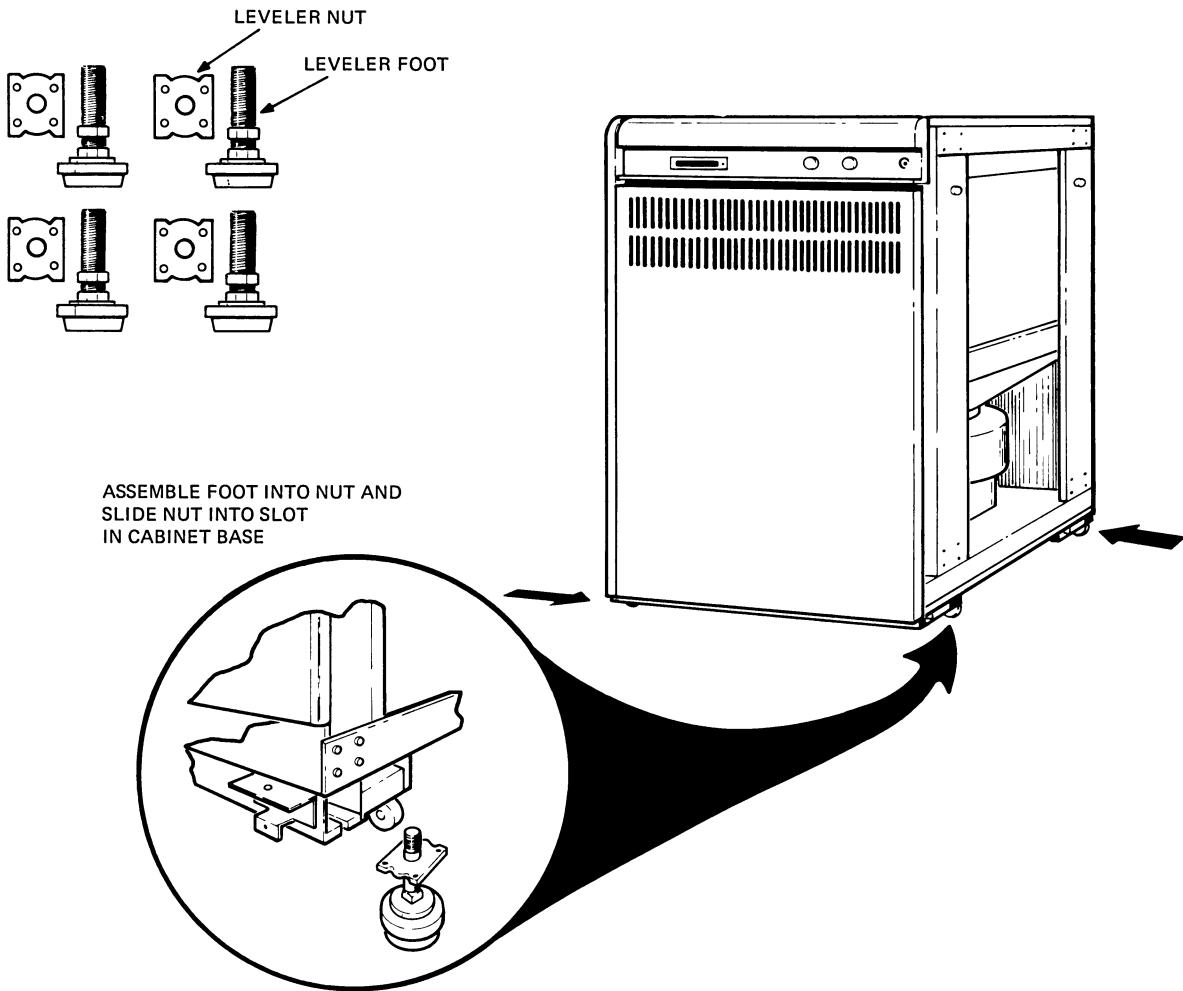


Figure 5-4 Removing Front Door



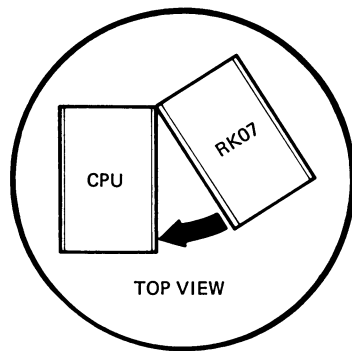
TK-5999

Figure 5-5 Right Panel Removal

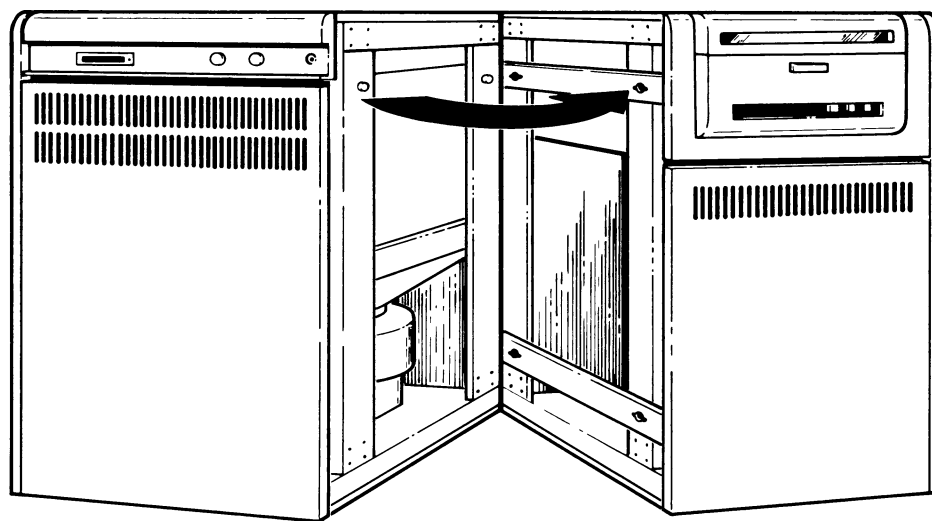
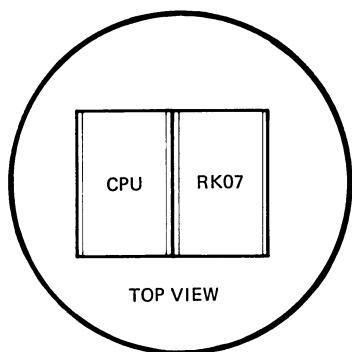
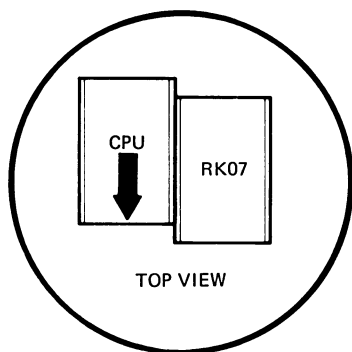


TK-6006

Figure 5-6 Installing Leveler Feet



③
POSITION CABINETS
AS SHOWN



ENGAGE TOP REAR KEY BUTTON
OF CPU CABINET IN KEYSLOTS
OF EXPANSION PANEL

NOTE: NO KEY BUTTONS ON BOTTOM
OF FRONT OR REAR UPRIGHTS
OF CPU CABINET

PUSH CABINETS TOGETHER TO
ENGAGE TOP FRONT KEY BUTTON

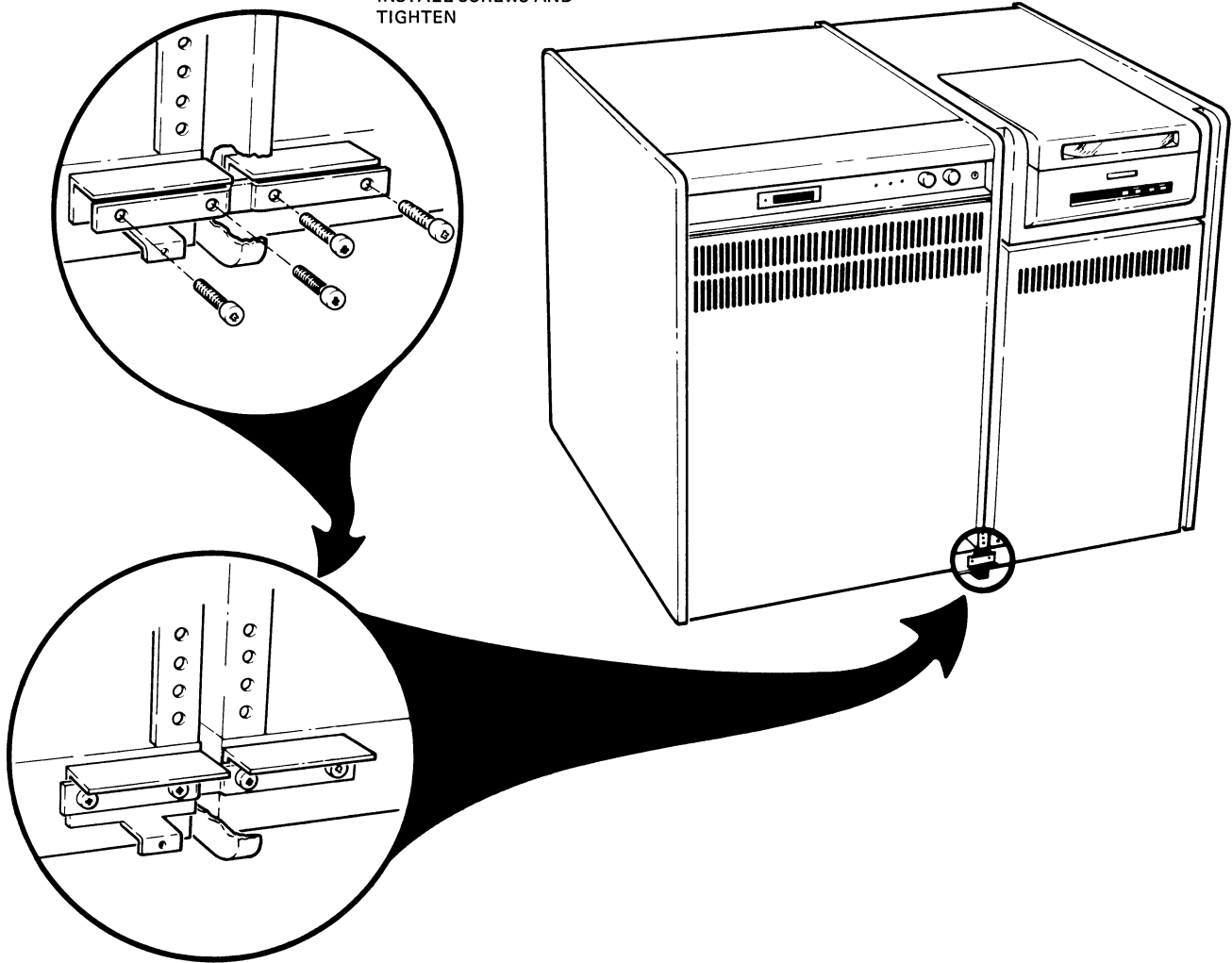
PULL RK07 CABINET FORWARD
TO LOCK KEY BUTTONS IN KEY SLOTS

TK-6004

Figure 5-7 Joining Cabinets

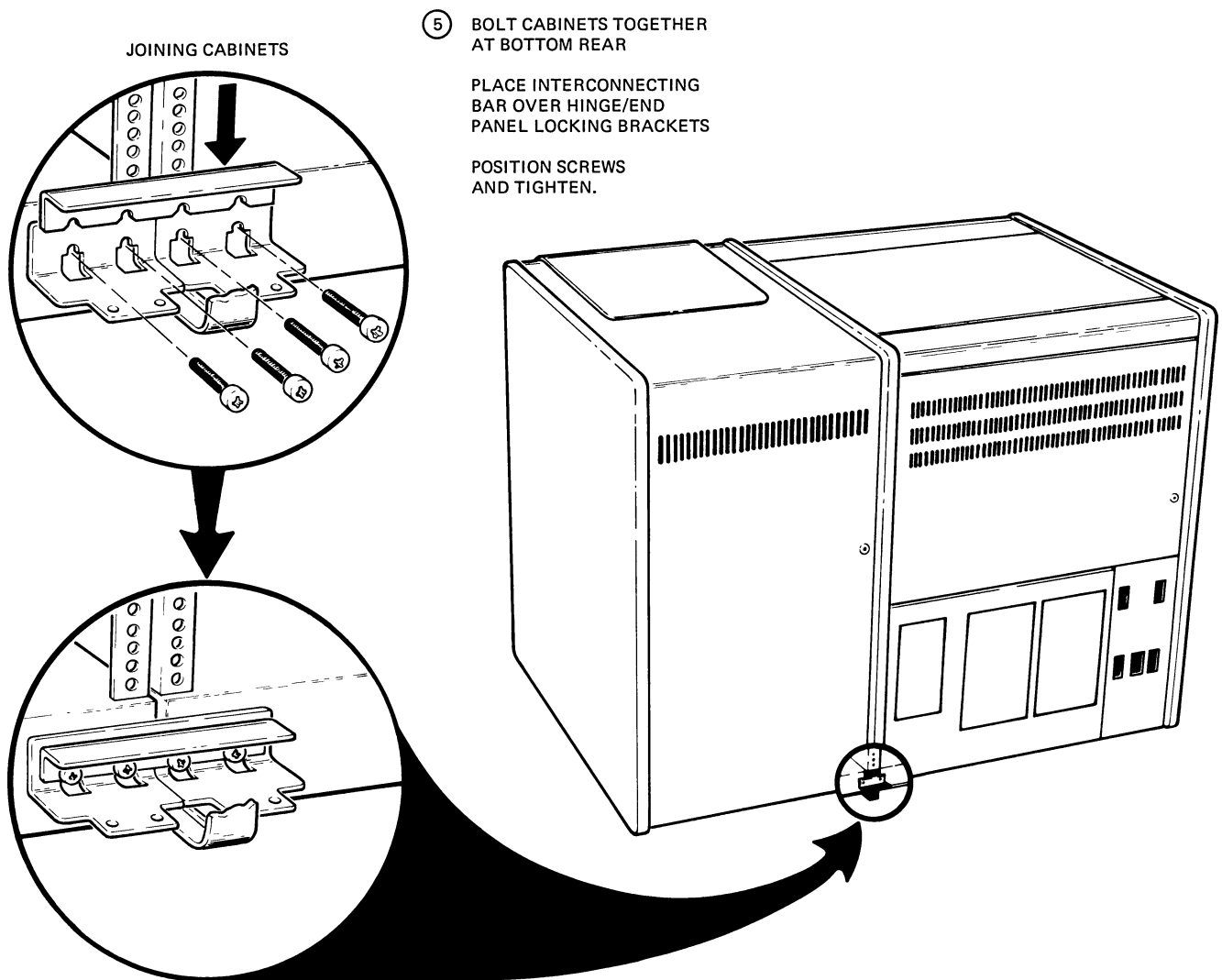
④ BOLT CABINETS TOGETHER
AT BOTTOM FRONT:

SLIDE INTERCONNECTING
BAR BEHIND ROLL-FORM—
POSITION AS SHOWN—
INSTALL SCREWS AND
TIGHTEN



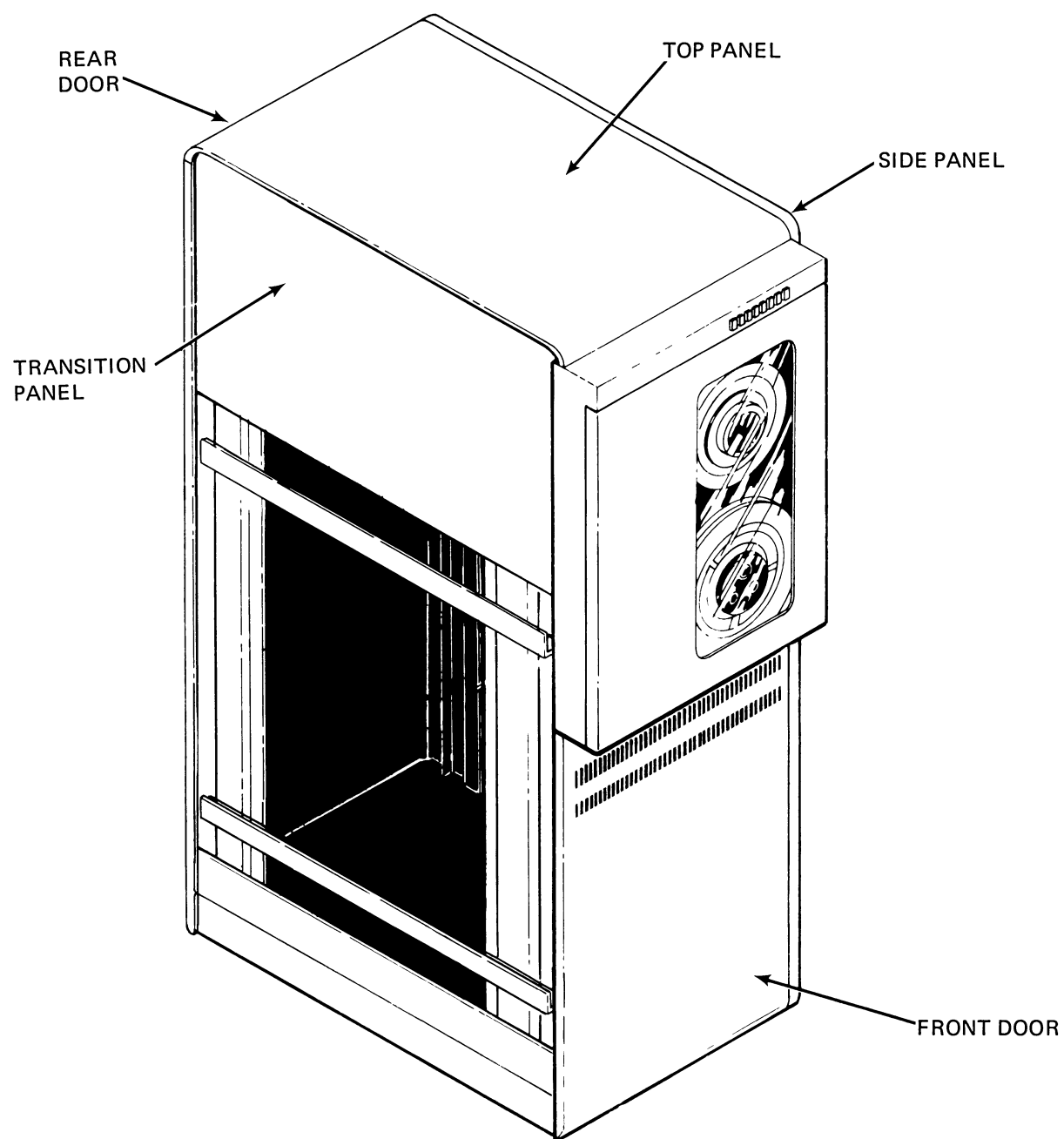
TK-6003

Figure 5-8 Bolting Cabinets Bottom Front



TK-6001

Figure 5-9 Bolting Cabinets Bottom Rear



TK-6005

Figure 5-10 TS11 Panels

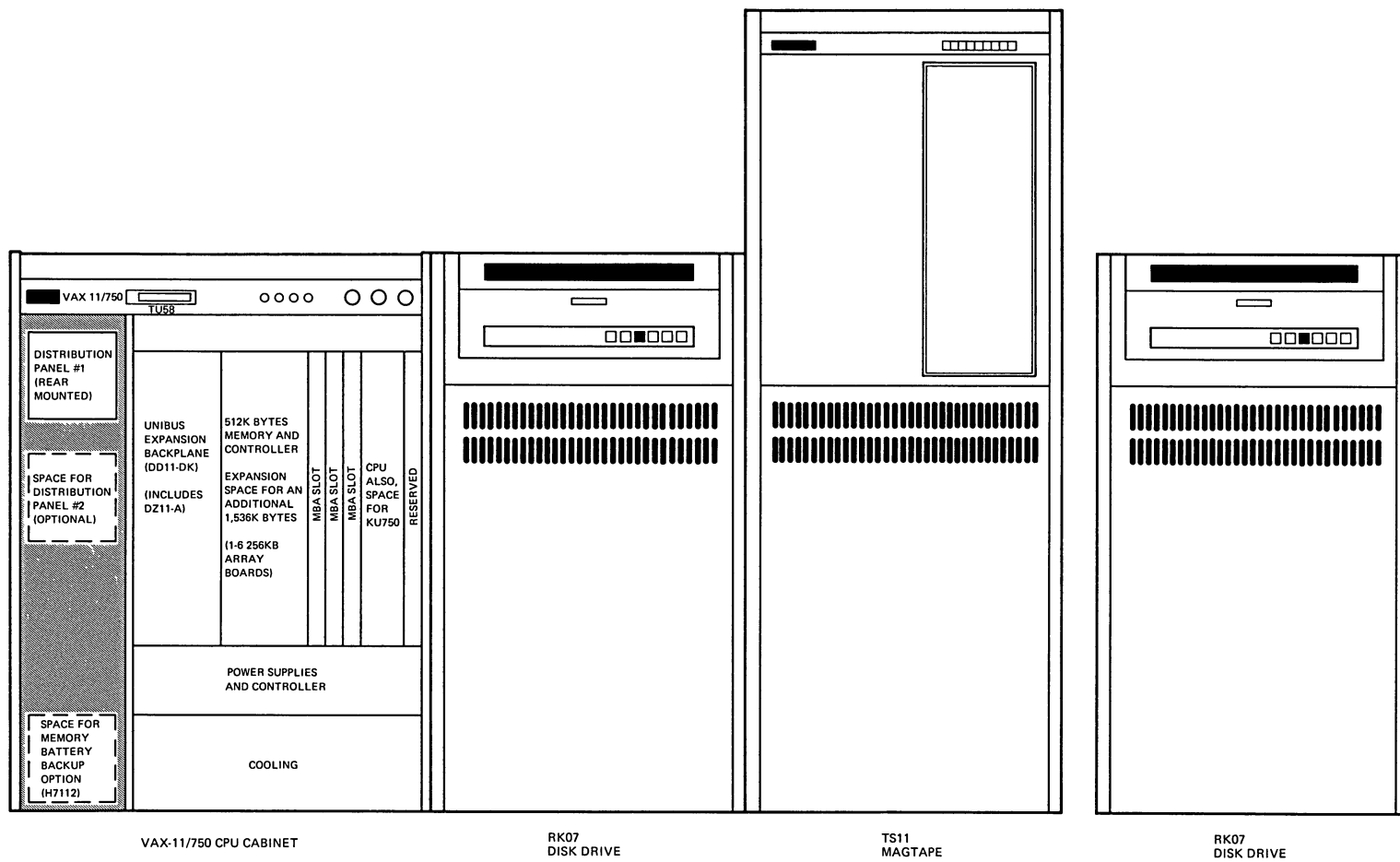
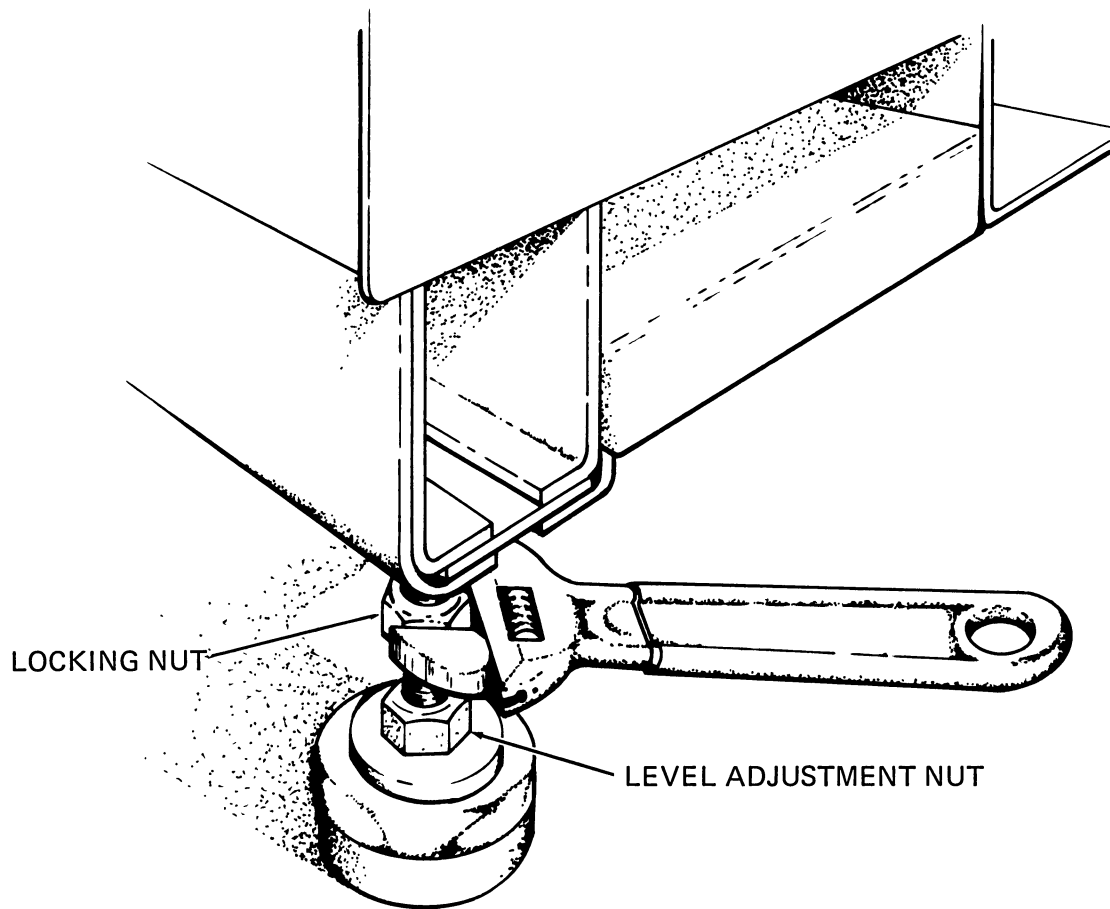


Figure 5-11 Dual RK07 with TS11 Magtape



TK-5986

Figure 5-12 Adjusting Leveling Feet

5.4 UNIBUS CABLE ROUTING

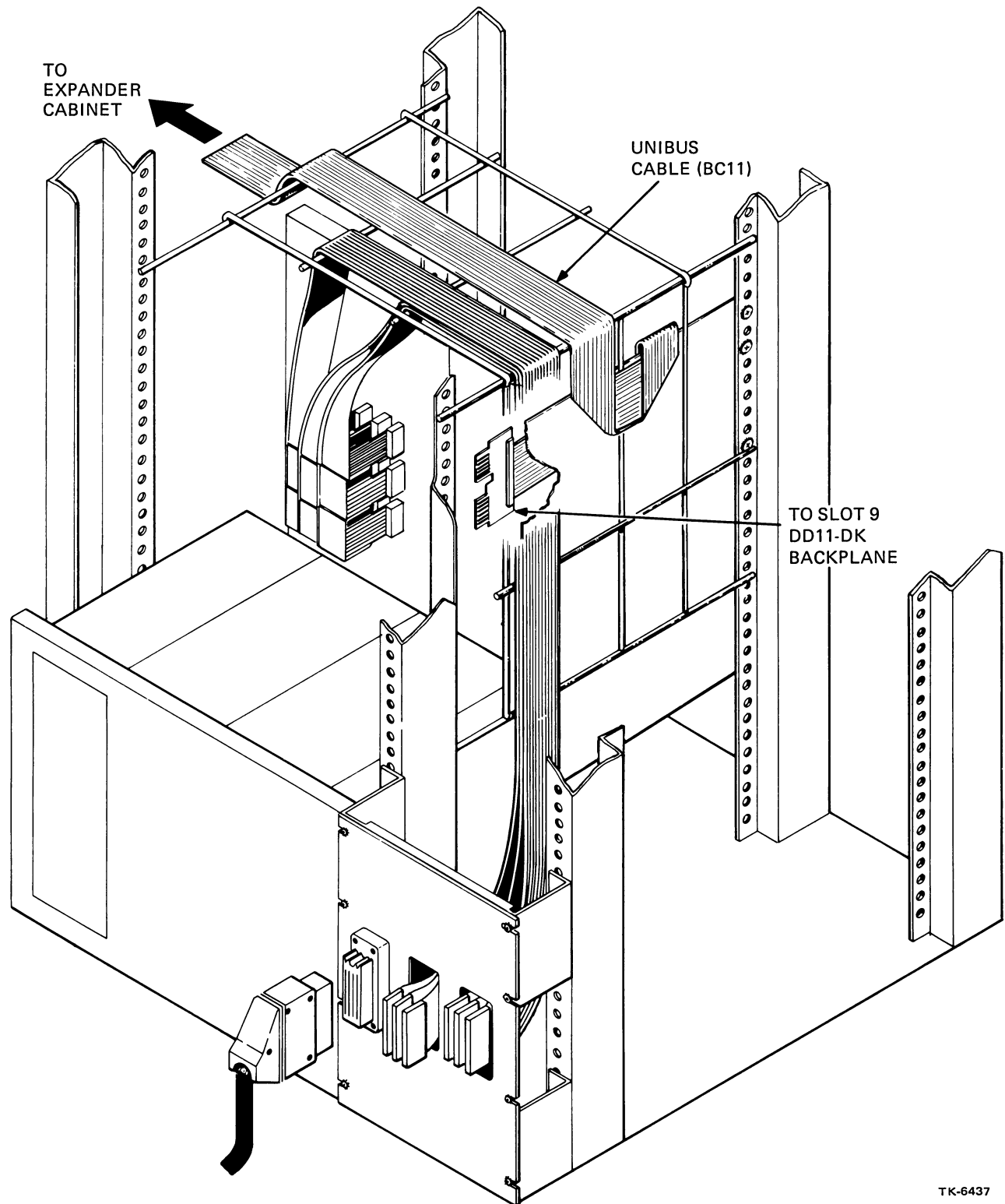
Route the BC11 cable from the CPU's DD11-DK backplane to the RK07/RK711 cabinet as follows:

1. Run the BC11 cable across the cable support rack above the CPU card box and down into the RK07/RK711 cabinet as illustrated in Figure 5-13.

NOTE

Early VAX-11/750 CPU cabinets do not have the cable rack. For these units, run cables on top of card box and secure with tie-wraps.

2. Make three right angle bias folds in the BC11 cable as illustrated in Figure 5-13.
3. Run the BC11 cable down between the first card guide and the card box side panel.
4. Insert the BC11 cable end into Slot 9 of the DD11-DK backplane.
5. Secure the UNIBUS cable with tie-wraps as appropriate.



TK-6437

Figure 5-13 UNIBUS Cabling

5.5 CPU BACKPLANE JUMPERING

In the process of installing the VAX-11/750 you will have to check and configure CPU backplane jumpers. Typically these jumper configurations are accomplished through the use of plastic push-on shorting plugs.

5.5.1 CPU Console Baud Rate (Slot 6)

The console baud rate is set to 300 baud at the factory. To set the baud rate to a different rate, change the jumper configuration on Slot 6, Connector C as indicated on the decal fixed to the backplane cover of the CPU cabinet.

5.5.2 CPU Hardware Revision Number (Slot 4)

The CPU hardware revision level is jumpered on Slot 4, Connector B as indicated on the CPU backplane decal.

5.5.3 CMI Option Slot Jumpers (Slots 7, 8, 9)

Any vacant CMI option slot must have four Bus Grant (BG) continuity jumper plugs installed. To verify this, check that the pin pairs listed in Table 5-1 have the push-on shorting plugs installed.

Any option slot which has an option module installed must have the four jumpers listed in Table 5-1 removed.

Table 5-1 Bus Grant Jumper Pins

Bus Grant	Jumpered Pins
BG4	A-67 to A-68
BG5	A-69 to A-70
BG6	A-73 to A-74
BG7	A-77 to A-78

5.6 UNIBUS OPTION INSTALLATION

Refer to the manufacturing configuration sheet that came with your system for option configuration information such as cabinet and box assignment, UNIBUS sequence, address/vector information and CMI arbitration level. Install and test each option following the appropriate installation information provided in the *VAX Options Installation Manual* (EK-VAXOP-IN) or the installation manual for the specific option. The appendices of this manual provide VAX-11/750 specific installation information for VAX-11/750 internally installed options.

Option cables connected to option controllers which are mounted in the CPU's DD11-DK backplane are to be routed by the following guidelines:

1. Ribbon cables (such as the TS11 serial bus cable) must stay within the system cabinet assembly and are to be routed on the CPU cabinet support rack.
2. Round cables within the CPU cabinet (such as LA11 lineprinter cable and terminal cables) must exit via the cable exit slot at the left rear of the cabinet base. Refer to Figure 5-13.
3. Secure all cabling with tie-wraps as required.

5.7 RH750 INSTALLATION

This section explains the unpacking, configuring, cabling, and installing of the RH750.

- Remove the RH750 adapter kit from its container.
- Inventory the kit against the inventory list in the kit. The following items are included in the kit.
 1. L0007 RH750 module
 2. MASSBUS cable assembly 70-18509-0-0
 3. Plastic cable guides (3) 12-16821-00
 4. Boot ROM 23-908-A9-00
 5. Transition connector for I/O panel 70-9861
 6. Backplane jumpers (5) 12-14314-00
 7. 25 foot MASSBUS cable BC06Y-25
 8. Jumper cord 70-09490
 9. Terminator assembly 70-09938
 10. Remote sensing cable 70-8288-30
 11. Ground strap 74-12827-25

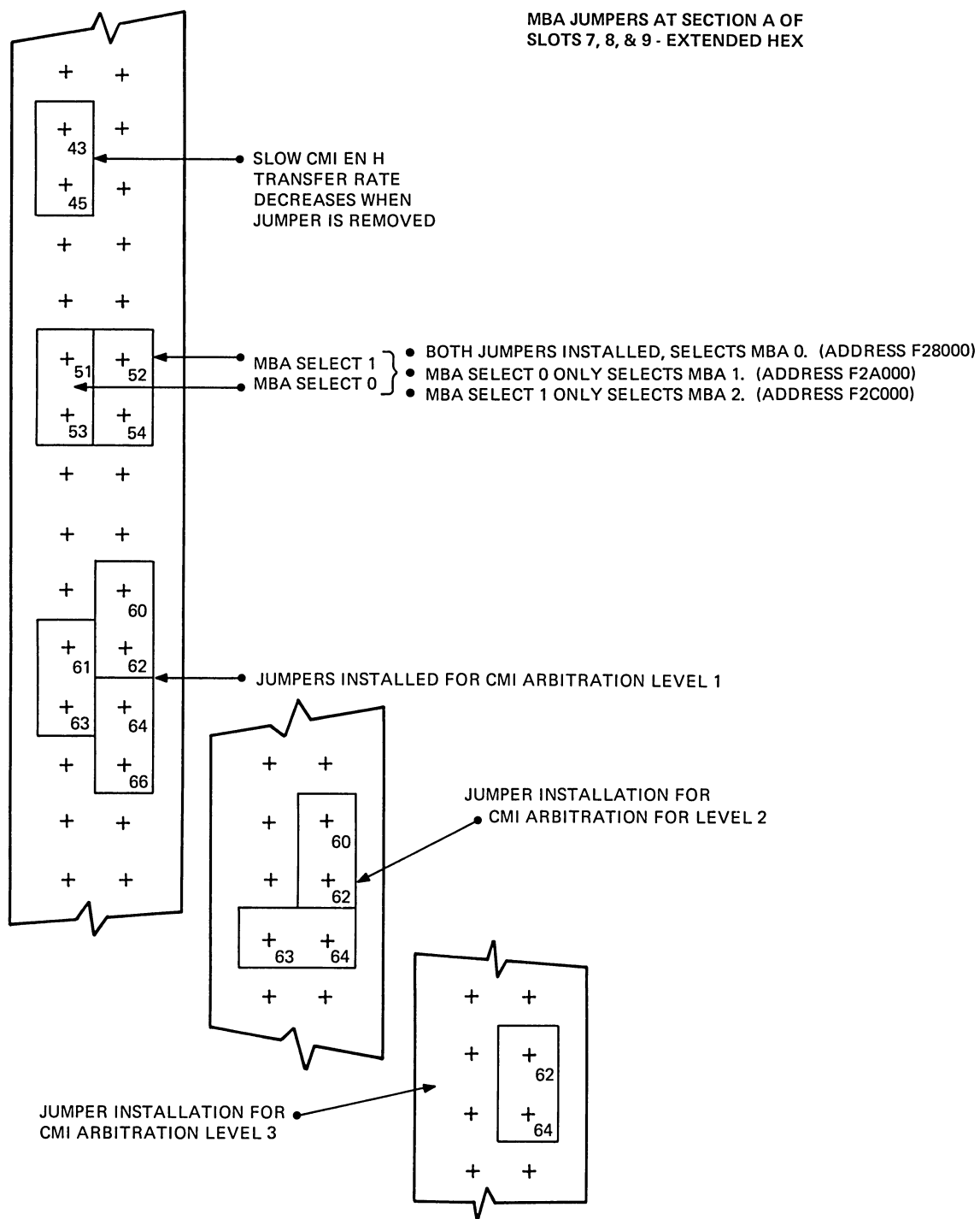
5.7.1 Configuring the RH750 Option

RH750 configuration consists of the following:

- CMI arbitration level and device address selection
 - CPU interrupt priority selection
 - cable installation
1. Obtain the device address and CMI arbitration information for the RH750 option from the manufacturing configuration sheet.
 2. Place jumpers on the CPU backplane for the CMI request level (CMI ARB), device address (MBA select) and a jumper for SLOW CMI EN H according to Figure 5-14 and Table 5-2. Table 5-2 is the suggested method of installation.

Table 5-2 RH750 Configuration

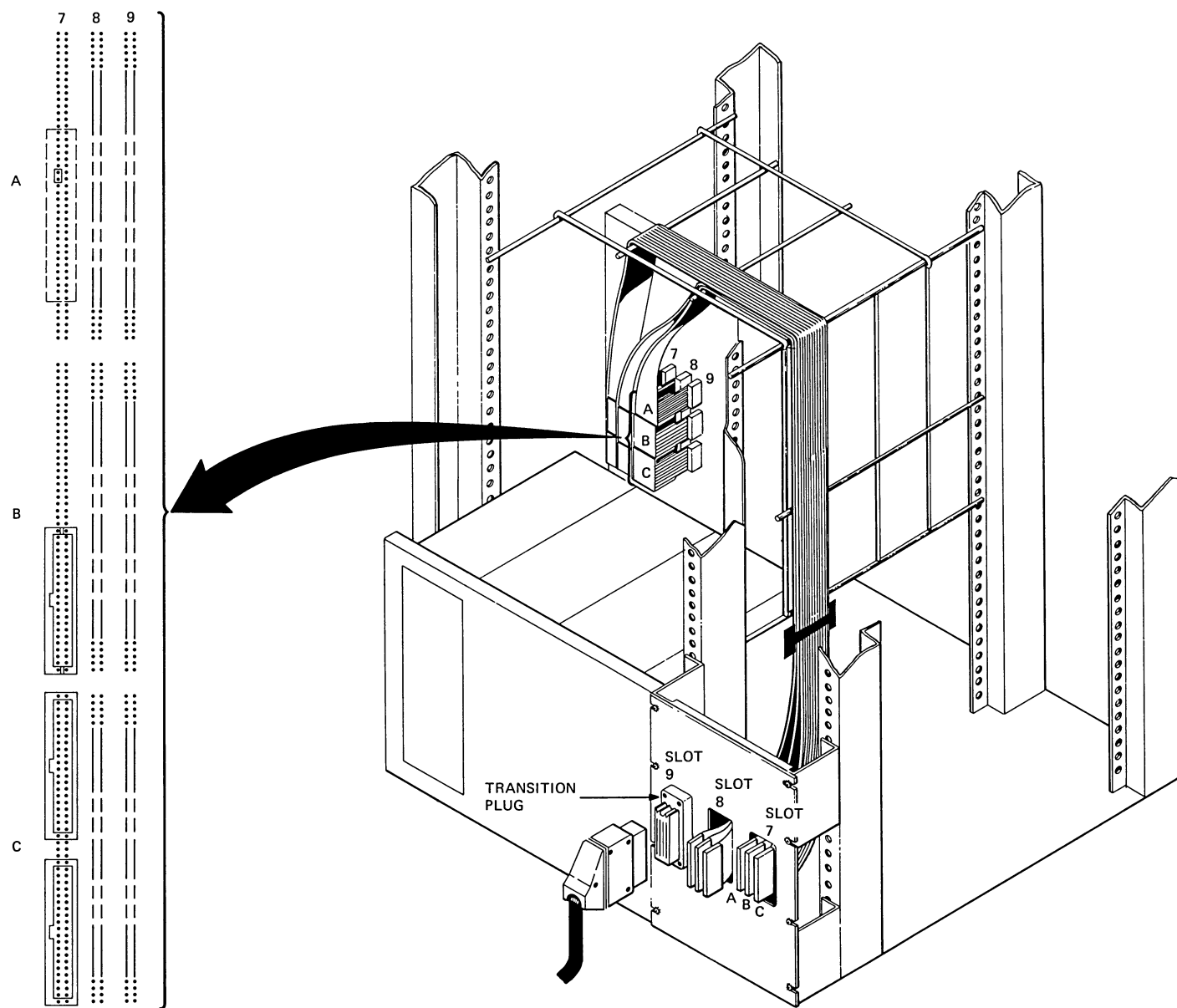
MBA #	Address	CMI ARB	SLOT	MBA Select <1:0>
0	F28000	3	9	00
1	F2A000	2	8	01
2	F2C000	1	7	10
MBA Select <0> = 0 Jumper installed from X00A54 to X00A52 (GND)				
= 1 Jumper removed from X00A54 to X00A52				
MBA Select <1> = 0 Jumper installed from X00A53 to X00A51 (GND)				
= 1 Jumper removed from X00A53 to X00A51				



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Figure 5-14 Arbitration/Device Number Jumper

3. Preferably the first or the only RH750 is installed in Slot 9 so that as additional RH750s are added, the cables can be placed on the top of existing cabling. Refer to Figure 5-15.
4. Verify that a priority plug is properly plugged into the L0007 module. This priority plug determines the BR level, and also part of the vector address. The vector address is also determined in part by the device number. Also verify that it is the correct BR level; typically it is BR5.
5. Plug the L0007 module into the designated slot.
6. Remove the plate on the I/O connector panel that corresponds to the specific RH750 slot (Figure 5-15).
7. Mount the transition connector (part number 70-9861) for the I/O panel (Figure 5-15).
8. Inspect the MASSBUS terminator. If the terminator contains three resistor cards, then insure that W2 (MASSBUS FAIL H) on cable C terminator card is removed.
9. Plug the MASSBUS terminator into the newly mounted I/O panel transition connector.
10. Boot the MASSBUS device. If the system fails to boot, verify that the boot ROM is functional by running the ECKAM diagnostic under the diagnostic supervisor. This diagnostic reads the ASCII device code, displays the boot ROM type, computes a checksum on the ROM content, and compares the result with the stored checksum in the last byte of the boot ROM. After loading the Diagnostic Supervisor and ECKAM, run Test 7 to verify the boot ROM. The console tape has command procedures to boot the system under the BOOT58 Program.
11. Run the MASSBUS adapter diagnostic, ECCAA (level 3).
12. Remove the terminator from the I/O connector panel plug.
13. Connect the MASSBUS cable to the first MASSBUS device. See the *VAX Options Installation Manual* (EK-VAXOP-IN) for specific MASSBUS device installation information.



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Figure 5-15 RH750 Cabling

CHAPTER 6 SYSTEM OPERATION

6.1 GENERAL

This chapter describes booting the primary device, using the commonly used diagnostic supervisor commands, and running VMS diagnostics. It also describes how to copy TU58 tapes. Please refer to the *VAX-11/750 Diagnostic System Overview Manual* (EK-VXD75-UG-PRE) for information on additional diagnostic supervisor commands.

6.2 PRIMARY BOOT DEVICE DIAGNOSTICS

You can boot the diagnostic supervisor from a disk by performing the following:

1. Press the INITIALIZE button on the CPU's front panel.
2. Place the power-on-action switch to the HALT position.
3. Place the boot-device-select switch in the position that corresponds to the diagnostic media.
4. Type the following *boot* command in response to the console prompt:

B/10<space><ddcu><cr>

5. Type @CONFIG after the diagnostic supervisor's prompt so as to invoke the configuration file. Invoking the configuration file defines the hardware configuration to the diagnostic supervisor.
6. Use the *attach* command whenever it is necessary to change the defined hardware configuration for the diagnostic supervisor.
7. Use the *select* command to select a device for testing.
8. Use the *run* command to load and start a diagnostic program.

6.3 BOOTING WITH CONSOLE COMMANDS

Before you type the *boot* command to boot either VMS or the diagnostic supervisor, the following conditions must be met.

- A disk drive, which is attached through any channel adapter to the VAX-11/750 system, is loaded with a disk pack containing a boot block, VMB.EXE, and either SYSBOOT.EXE and VMS, or the SYSMANT directory.
- The BOOT DEVICE switch points to the bootstrap ROM that corresponds to the disk that contains the boot block.

The following command is used to boot VMS or the diagnostic supervisor from a specific device:

B[/X][/][<space><ddcu>]<CR>

Qualifier	Definition
/X	If you type /X the boot command inhibits micro verify.
/n	<n> is a hexadecimal number that specifies the boot control flags. If <n> is omitted, the default value is 0. Table 6-1 describes the software boot control flags.
<space>	<space> represents one typed space.
<ddcu>	<p><ddcu> represents the device to be booted, as follows:</p> <p>dd is a two letter boot device code as shown in Table 6-2.</p> <p>c specifies the I/O channel adapter with a possible value of either A, B, C, or D.</p> <p>u is a one-digit number that specifies the device number.</p>

See Example 6-1 for boot command examples.

Table 6-1 Software Boot Control Flags

Flag	Hex Value	Function
0	1	conversational boot
1	2	debug
2	4	initial breakpoint
3	8	not used
4	10	diagnostic boot
5	20	bootstrap breakthrough
6	40	image header
7	80	memory text inhibit
8	100	filename
9	200	halt before transfer

Table 6-2 Boot Device Codes

Device Code (dd)	Device Type
DL	RL02
DM	RK07
DB	RP04/5/6
DR	RM03
DD	TU58

```

>>>B/X DMA0          ! Boot VMS from
                        ! the RK07 on channel adapter A
                        ! drive 0 without running micro
                        ! verify.
.
>>>B/10 DRA1         ! Boot the diagnostic
                        ! supervisor in the
                        ! standalone mode
                        ! from the RM03
                        ! on channel adapter
                        ! A, drive 1 after running
                        ! micro verify.

```

Example 6-1 Boot Commands

Refer to the *VAX-11/750 Diagnostic System Overview Manual* (EK-VXD-750-UG) for the function description.

NOTE

The device code for the bootstrap ROMs installed in the memory controller (L0011) can be examined by console examines of the following byte locations:

F20400	Boot Device A
F20500	Boot Device B
F20600	Boot Device C
F20700	Boot Device D

Whenever you do not specify <ddcu> the console uses the BOOT DEVICE switch position on the CPU's front panel to determine the default device.

At the completion of a successful boot the following are true:

- the console prints a message indicating whether the micro verify test revealed any errors, except when /X is typed in the bootstrap command where micro verify is not performed. Refer to Chapter 4 for the micro verify console messages.
- the console enters the program I/O mode

6.4 @CONFIG COMMAND

After loading diagnostics from the SYSMANT directory, which was contained on a system disk, you type @CONFIG to invoke the configuration file. This file consists of a series of *attach* commands that define the hardware configuration for the diagnostic supervisor (Example 6-2).

6.5 ATTACH COMMAND

The *attach* command is used to test devices not mentioned in the configuration file. The attach command defines each unit under test (UUT). It also defines the device that links the tested device to the CMI bus for the diagnostic supervisor. Every UUT is uniquely defined by a hardware designation and a link (Example 6-3).

The command format is:

ATTACH <uut-type> <link-name> <generic-device name> <CR>

The first parameter <uut-type> is the hardware designation of the UUT. For example, RH750, TM03, and TE16 are hardware designations. Refer to Table 6-3.

The second parameter, <link-name>, is the name of the hardware that links the UUT to the CMI bus.

Example 6-3 shows an attach command example. Table 6-3 lists the device naming codes.

The third parameter is the generic device name, which identifies to the diagnostic supervisor the particular unit to be tested. Use the form "GGan" for the device name. "GG" is a 2-character generic device name (alphabetic), while "a" is an alphabetic character specifying the device controller, and "n" is a decimal number in the range of 0-255, specifying the number of the unit with respect to the controller.

The definitions for the additional fields are:

<drive>	MASSBUS drive	decimal	0-7
<ucsr>	UNIBUS CSR address	octal	760000-777776
<uvector>	UNIBUS vector	octal	2-776
<ubr>	UNIBUS BR level	decimal	4-7

In the generic name:

"a" is a letter from A to Z.

"n" is a decimal number in the range 0-255.

"?" is a generic device name that may be any two letters.

Use the unit number, "n" or "a", only if it is applicable to the device. At times you must supply additional information for some types of hardware to enable the diagnostic program to address the device. For example, you must supply the controller number for a TM03. Whenever you do not include the necessary additional information, the supervisor prompts you for it (Example 6-3).

DIAGNOSTIC SUPERVISOR. ZZ-ECSAA 5.00-61 1 JAN 1980 00:00:00:00

```

DS> @CONFIG<CR>      ! An indirect command file used to
                      ! define the system
                      ! hardware configuration
                      ! to the supervisor.

DS> ATTACH KA750 CMI KA0 NO NO YES 0 0
DS> ATTACH TU58 KA0 CS1
DS> ATTACH DW750 CMI DW0
DS> ATTACH RK611 DW0 DMA 777440 210 5
DS> ATTACH RK07 DMA DMA0
DS> ATTACH RK07 DMA DMA1
DS> ATTACH RL11 DW0 DLA 774400 160 5
DS> ATTACH RL02 DLA DLA0
DS> ATTACH RL02 DLA DLA1
DS> ATTACH TS11 DW0 MSA0 772520 224 5
DS> ATTACH LP11 DW0 LPA 777514 200 4
DS> ATTACH LP05 LPA LPA0
DS> ATTACH DMC11 DW0 XMA 760070 300 5
DS> ATTACH DZ11 DW0 TTA 760110 310 5 EIA
DS> ATTACH VT100 TTA TTA1
DS> ATTACH VT100 TTA TTA2
DS> ATTACH VT100 TTA TTA3
DS> ATTACH VT100 TTA TTA4
DS> ATTACH VT100 TTA TTA5
DS> ATTACH VT100 TTA TTA6
DS> ATTACH VT100 TTA TTA7
DS> !
DS> @ <EOF>
DS> SHOW DEVICE
_KA0 KA750          40F30000  G-floating instructions=NO
                      H-floating instructions=NO
                      Time-of-year clock=YES WCS last
address=00000000(X)
                      Accelerator type=0.
_DW0 DW750          40F30000
_DMA RK611 _DW0     40FFFF20  CSR=777440(0)  VECTOR=000210(0)
BR=5.
_DMA0 RK07 _DMA     00000000
_DMA1 RK07 _DMA     00000000
_DLA RL11 _DW0     40FFF900  CSR=774400(0)  VECTOR=000160(0)
BR=5.
_DLA0 RL02 _DLA     00000000
_CS1 TU58 _KA0      00000000
_LPA LP11 _DW0     40FFFF4C  CSR=777514(0)  VECTOR=000200(0)
BR=4.
_LPA0 LP05 _LPA     00000000
_MSA0 TS11 _DW0     40FFF550  CSR=772520(0)  VECTOR=000224(0)
BR=5.
DS> @ <EOF>

DS> SELECT DW0      ; Select DW0 for testing.
DS> RUN ECCBA       ; Run the UBI
                      ; diagnostic program.

```

Example 6-2 Diagnostic Supervisor Commands

DS> ATTACH DZ11 DW0 TTA	! Attach the DZ11,TTA.
CSR? <u>760120</u>	! The supervisor prompts
VECTOR? <u>320</u>	! for information not
BR? 4	! supplied in the command
MODULE TYPE? <u>EIA</u>	! line.
DS>	

Example 6-3 Attach Command

Table 6-3 Device Naming Code

Type	Link	Generic	Additional Information
KA750	CMI	KAn	<G-floating> <H-floating> <time-of-year clock> <WCS-last-address> <accelerator type>
RH750	CMI	RHa	
DW750	CMI	DWa	
RP06	RHa	DBan	
RP05	RHa	DBan	
RP04	RHa	DBan	
RM03	RHa	DRan	
RK611	DWa	DMa	<ucsr> <uvector> <ubr>
RK07	DMa	DMan	
RK06	DMa	DMan	
TM03	RHa	MTa	<drive>
TE16	MTa	MTan	
TU45	MTa	MTan	
TU77	MTa	MTan	
DZ11	DWa	TTA	<ucsr> <uvector> <ubr> <EIA> ! <20MA>
DUP11	DWa	XJan	<ucsr> <uvector> <ubr>
DMC11	DWa	XMan	<ucsr> <uvector> <ubr>
KMC11	DWa	XMan	<ucsr> <uvector> <ubr>
LP11	DWa	LPa	<ucsr> <uvector> <ubr>
CR11	DWa	CRA	<ucsr> <uvector> <ubr>
DR11B	DWa	??a	<ucsr> <uvector> <ubr>
PCL11	DWa	??a	<ucsr> <uvector> <ubr>
TS04	DWa	MTan	<ucsr> <uvector> <ubr>
RL02	DLa	DLa	
RL11	DWa	DLa	<ucsr> <uvector> <ubr>

6.6 SELECT COMMAND

The select command format is:

```
SELECT<space><generic-device name>[:]<CR>
```

You must select each unit to be tested with the *select* command. The command takes effect the next time the diagnostic program is started. For each unit, you supply the appropriate generic device name, as shown in Table 6-3 and Example 6-2.

6.7 SHOW DEVICE COMMAND

The show device command format is:

```
SHOW DEVICE <generic-device-name>[:]-<CR>  
[,<generic-device-name>[:] . . .]<CR>
```

This command causes the diagnostic supervisor to display the characteristics of the specified devices on the operator's terminal. If you omit the device name, the diagnostic supervisor will list the characteristics of all attached devices.

6.8 SHOW SELECT COMMAND

The show select command format is:

```
SHOW SELECT <CR>
```

This command displays information in the same format as the show device command. However, the information is shown only for the devices that have been previously selected.

6.9 RUN COMMAND

The run command is equivalent to a *load* and *start* command sequence. The run command format is:

```
RUN<space><file-spec><CR>
```

Refer to Example 6-2.

6.10 RUNNING VMS DIAGNOSTICS (USER MODE)

To run diagnostics with VMS (on-line), proceed as follows:

1. Boot VMS (Paragraph 6.2).
2. Log into the field service account.
3. Type RUN ECSAA, after VMS's prompt, \$, to load the diagnostic supervisor (Paragraph 6.6).
4. Invoke the configuration file to define the hardware configuration for the diagnostic supervisor (Paragraph 6.3).
5. Use the *select* command to select a device for testing (Paragraph 6.5).
6. Use the *show device* command to display the characteristics of the specified devices on the operator's terminal.
7. Use the *show select* command to display the information for the device(s) that has (have) been previously selected.
8. Use the *run* command to run the required diagnostic program (Paragraph 6.6).

Example 6-4 shows how to run a VMS Diagnostic program.

6.10.1 Diagnostic Testing Strategies

The bottom to top diagnostic testing strategy for the VAX-11/750 is to run the level 4, 3, 2, and finally level 1 diagnostics. The following is the preferred sequential testing strategy.

LEVEL 4	EVKAA	Hardcore instruction exerciser
	ECKAL	Cache /TB diagnostic

If the micro verify sequence works, you should attempt to run EVKAA. This program just halts on failure. ECKAL is a level 4 diagnostic like EVKAA and just halts on failure. You may be able to use the diagnostic supervisor and ECCBA (UBI diagnostic program) to isolate the fault. ECKAL requires that UBI, the UNIBUS, and UET (M9313) be functional to complete successfully.

LEVEL 3	EVKAB	CPU Instruction Exerciser
	EVKAC	Floating-Point Instruction Exerciser
	EVKAD	Compatibility Mode Instruction Test
	EVKAE	Privileged Architecture Test
	EVKAX	VAX-11/750 Specific, WCS, and TU58 diagnostic
	ECKAM	VAX-11/750 memory diagnostic
	ECCBA	UBI diagnostic
	ECCAA	RH750 diagnostic

These level 3 diagnostics should be run in the order shown. ECKAX requires manual intervention if all tests are selected and a scratch TU58 tape is needed to exercise the TU58. ECKAM is a memory diagnostic; the major assumption made by this program is that the first 256 KB is functional. The UBI diagnostic assumes the presence of the M9313 UET to function. The system does not require the M9313 to operate, but this diagnostic will fail without it.

LEVEL 2

These diagnostics are selected depending on the system configuration, and run under VMS. Some of the VMS on-line diagnostics that will not run standalone are classified as level 2R. These include line-printer diagnostics, multiterminal output diagnostics, etc.

LEVEL 1

VMS user mode diagnostics. Refer to Chapter 7 for an explanation of UETP.

6.11 COPYING TU58 TAPES

The file transfer program FLX is used to copy TU58 tapes. This section describes the commands used in copying TU58 tapes, and also shows an example of copying the diagnostic program ECKAL onto a TU58 tape from disk. Additional information on the file transfer program FLX is found in the *RSX-11 Utilities Procedure Manual* (DEC-11-OXMDA-A-D).

Username: FIELD
 Password:
 Welcome to VAX/VMS Version 2.0

\$ RUN ECSAA
 DIAGNOSTIC SUPERVISOR. ZZ-ECSAA-5.4-121 21-AUG-1980 08:30:36

```

DS> @CONFIG
DS> ATTACH KA750 CMI KA0 NO NO YES 0 0
DS> ATTACH TU58 KA0 CS1
DS> ATTACH DW750 CMI DW0
DS> ATTACH RK611 DW0 DMA 777440 210 5
DS> ATTACH RK07 DMA DMA0
DS> ATTACH RK07 DMA DMA1
DS> ATTACH RL11 DLA 774400 160 5
DS> ATTACH RL02 DLA DLA0
DS> ATTACH RL02 DLA DLA1
DS> ATTACH TS11 DW0 MSA0 772520 224 5
DS> ATTACH LP11 DW0 LPA 777514 200 4
DS> ATTACH LP05 LPA LPA0
DS> ATTACH DMC11 DW0 XMA 760070 300 5
DS> ATTACH DZ11 DW0 TTA 760110 310 5 EIA
DS> ATTACH VT100 TTA TTA1
DS> ATTACH VT100 TTA TTA2
DS> ATTACH VT100 TTA TTA3
DS> ATTACH VT100 TTA TTA4
DS> ATTACH VT100 TTA TTA5
DS> ATTACH VT100 TTA TTA6
DS> ATTACH VT100 TTA TTA7
DS> !
DS> @ <EOF>
DS> SELECT MSA0
DS> SHOW DEVICE
_KA0 KA750 40F30000 G-floating instructions=NO
H-floating instructions=NO
Time-of-year clock=YES WCS
last address=00000000(X)
Accelerator type=0.

_DW0 DW750 40F30000
_DMA RK611 _DW0 40FFFF20 CSR=777440(0) VECTOR=000210(0)
BR=5.
_DMA0 RK07 _DMA 00000000
_DMA1 RK07 _DMA 00000000
_DLA RL11 _DW0 40FFF900 CSR=774400(0) VECTOR=000160(0)
BR=5.
_DLA0 RL02 _DLA 00000000
_CS1 TU58 _KA0 00000000
_LPA LP11 _DW0 40FFFF4C CSR=777514(0) VECTOR=000200(0)
BR=4.
_LPA0 LP05 _LPA 00000000
_MSA0 TS11 _DW0 40FFF550 CSR=772520(0) VECTOR=000224(0)
BR=5.
DS> SHOW SELECT
_MSA0 TS11 _DW0 40FFF550 CSR=772520(0) VECTOR=000224(0)
BR=5.
DS> RUN EVMAA

```

Example 6-4 Running VMS Diagnostics

Before you can copy a TU58 tape you must perform the following:

- Connect the console using the SYSGEN utility, unless already done by system manager. The Help command in SYSGEN utility is useful for explaining this procedure.
- Mount the TU58 tape by inserting a TU58 cartridge (cartridge tab is in the record position) into the TU58 slot on the CPU's front panel.

NOTE

Whenever you mount a volume currently in FILES-11 format with the foreign qualifier, you must have the override volume protection user privilege (VOLPRO), or you must be the owner of the volume.

6.11.1 Console Connecting and Mount Command

Before writing onto a TU58 tape you must connect the console using the SYSGEN utility, and also mount a write-enable tape.

```
$ RUN SYS$SYSTEM:SYSGEN <CR>
SYSGEN> CONNECT CONSOLE <CR>
SYSGEN> EXIT <CR>

$ MOUNT/FOREIGN CSA1: <CR>
%MOUNT-I-MOUNTED, MOUNTED ON__CSA1:
```

6.11.2 Initializing Command

This command initializes a TU58 tape that contains unwanted information.

```
$ MC FLX <CR>
FLX> CS1:/RT/ZE <CR>
FLX> C
$
```

6.11.3 Write File Command

This command writes a specified file onto the TU58 tape.

```
$ MCR FLX <CR>
FLX> CS1:/RT=FILENAME/RS <CR>
FLX> ^C
$
```

6.11.4 Deleting File Command

This command deletes a specified file from the TU58 tape.

```
$ MC FLX <CR>
FLX> CS1:FILENAME/RT/DE <CR>
FLX> ^C
$
```

6.11.5 Read File Command

This command reads a specified file from the TU58 tape.

```
$ MC FLX <CR>
FLX> /RS=CS1:FILENAME/RT <CR>
FLX> ^C
$
```

6.11.6 Copying Executable Image File Command

This command copies an executable image, such as a diagnostic program, onto a TU58 tape. The IM qualifier identifies the file as an executable image.

```
$ MC FLX <CR>
FLX> CS1:/RT/IM=FILENAME.EXE/RS <CR>
FLX> ^C
$
```

6.11.7 Writeboot Command

The writeboot command under VMS links the file to the bootfile on block zero. This linking makes the file bootable. The diagnostic ECKAL and the diagnostic supervisor are examples of bootable files.

```
MOU/FOR CSA1: <CR>
%MOUNT-I-MOUNTED.                mounted on__CSA1:
$ MC WRITEBOOT
Target system device (and boot file if not VMB.EXE):
CS1:FILENAME.EXE <CR>
Enter VBN of boot file code (default is 1): 1 <CR>
Enter load address of primary bootstrap in HEX (default is 200): 200 <CR>
$
```

All linked programs that are not specified as system will have a header created that resides in VBN 1 and an executable program that starts in VBN 2. The diagnostic supervisor has a header, thus its executable program starts in VBN 2.

6.11.8 Tape Directory Command

This command will print out the tape directory. Either LI or DI can be used for a qualifier.

```
$ MC FLX <CR>
FLX> CS1:/RT/LI <CR>
```

6.11.9 Example of Copying a TU58 Tape

The following is an example of how to copy a TU58 tape. It shows the commands used to write the diagnostic program ECKAL onto a TU58 tape.

```
>>> B DMA0 <CR>
```

```
%%
```

```
VAX/VMS Version V2.0 6-APR-1980 16:55
```

```
Username:   FIELD <CR>
```

```
Password:
```

```
Welcome to VAX.VMS Version V2.0
```

```
$ RUN SYS$SYSTEM:SYSGEN <CS>
```

```
SYSGEN> CONNECT CONSOLE <CR>
```

```
SYSGEN> EXIT <CR>
```

```
$ MOUNT/FOREIGN CSA1: <CR>
```

```
%MOUNT-I-MOUNTED,
```

```
mounted on__CSA1:
```

```
$ MC FLX <CR>
```

```
FLX> CS1:RT/ZE <CR>
```

```
FLX>
```

```
^Y
```

```
$ MC FLX <CR>
```

```
FLX> CS1:/RT/IM=ECKAL.EXE/RS <CR>
```

```
FLX>
```

```
^Y
```

```
$ MC WRITEBOOT <CR>
```

```
Target system device (and boot file if not VMB.EXE): CS1:ECKAL.EXE <CR>
```

```
Enter VBN of boot file code (default is 1) : 2 <CR>
```

```
Enter load address of primary bootstrap in HEX (default is 200): 200 <CR>
```

```
$ MC FLX <CR>
```

```
FLX> CS1:RT/LI <CR>
```

```
DIRECTORY CS1:
```

```
22-AUG-80
```

```
ECKAL .EXE 42. 22-AUG-80
```

```
< UNUSED > 460.
```

```
460. FREE BLOCKS
```

```
TOTAL OF 42. BLOCKS IN 1. FILES
```

```
FLX>
```

```
^Y
```

6.12 COPYING THE DISTRIBUTION MEDIUM

The VAX-11/750 is shipped with the following: a VMS kit, a diagnostic kit, and two scratch disks. A UNIBUS system will have its distribution medium on a RK07 disk pack, while a MASSBUS system has its distribution medium on magnetic tape. Since the VAX/VMS system can only be bootstrapped from a disk, the MASSBUS distribution tape must be copied onto one of the scratch disks before you bootstrap the system. You should then retain the tape as a backup copy of the distributed system. On the other hand, if you receive an RK07 kit, you should back up the system before bootstrapping by copying the distribution disk to another disk. You should use the newly created system disk to bootstrap the system, and retain the original disk as a backup copy of the distributed system. The original VMS kit should never be bootstrapped to avoid jeopardizing the VMS kit pack.

6.12.1 Loading Standalone DSC-2

The procedure for loading standalone DSC-2 is as follows:

1. Place the power-up-action switch in the HALT position.
2. Place the keyswitch in the LOCAL position.
3. Insert the DSCA cassette into the TU58 slot.
4. Boot the DSCA cassette with the command `B DDA0 <CR>`. It takes about thirty minutes to load DSCA.
5. Load the second cassette DSCB by inserting the DSCB cassette into the TU58 and then doing a carriage return. The console will prompt you when it is time to insert the DSCB cassette. When DSCB is loaded, the console will prompt with `DSC2>`.

NOTE

Leave the DSCB tape in the TU58 tape transport throughout the DSC process.

6.12.2 UNIBUS System (Disk to Disk)

This procedure copies from one disk pack to another.

1. Mount the VMS kit (source disk) on RK07 unit 1.
2. Place the disk drive with the source disk into write protect.
3. Mount a scratch disk on RK07 unit 0.
4. Perform the following command:

`DSC2> DMA0:/VE=DMA1:<CR>`
5. Use another device code in the above command if a RK07 is not used (Table 6-2).
6. Proceed to Paragraph 6.12.4.

6.12.3 MASSBUS Based System RM03/TS11 (Tape to Disk VMS System Transfer)

This procedure describes how to transfer a VMS distribution magtape to the system device.

1. Mount scratch disk cartridge in the RM03 drive.
2. Ensure that the distribution magtape is WRITE PROTECTED.
3. Mount the VMS distribution tape on the TS11.
4. Perform the following command:

`DSC2>DRA0:/VE=MSA0:/RW`

5. Perform the diagnostic transfer explained below.

6.12.4 Copying the Diagnostic Media to the System Device

The procedure for the three possible diagnostic media is explained. An automatic diagnostic update command procedure (EVUBC.COM) will be available in the near future to transfer diagnostics from any of the media described below to the [SYSMAINT] area of the disk.

1. TU58 Diagnostic Distribution (Dual RK07 package system)
 - a. If the diagnostic update or diagnostic kit must be entered into the system from TU58 cartridges, the FLX utility can be used for the transfer.
 - b. Perform the following commands once the new VMS system is installed and booted. Log into the system manager's account to perform this procedure.
 - c.

```
$ MOUNT CS1:/FOR
$ SET DEF SYS$SYSDISK:[SYSMAINT]
$ MC FLX
FLX> /RS=CS1:*.*/RT/IM
FLX>
```
 - d. At this point all the diagnostics and files on this tape have been transferred to the [SYSMAINT] directory.
 - e. Insert the next tape and repeat the FLX> command in step c to copy the next tape.

```
FLX> /RS=CS1:*.*/RT/IM
FLX>
```
 - f. Repeat this process until all tapes have been transferred to the [SYSMAINT] area.
2. RK07 VAXPAX Diagnostic Distribution (Dual RK07 package system)
 - a. Mount the VAXPAX disk cartridge in drive 1.
 - b. Mount the newly created VMS system in drive 0.

- c. Boot the new VMS system from drive 0 and log into the system manager's account. Perform the following commands to transfer the VAXPAX diagnostics to the system device.

```
$ MOUNT DMA1: VAXPAX
$ SET DEF SYS$SYSDISK:[SYSMAINT]
$ COPY DMA1:[SYSMAINT]*.* *
$ DIR/FULL DIAGBOOT.EXE,ECSAA.EXE
```

- d. Certify that DIAGBOOT.EXE and ECSAA.EXE are contiguous disk files. If not, copy them to themselves using the /CONTIG switch.
- e. This completes diagnostic transfer to the system device.

3. MAGTAPE VAXPAX Diagnostic Distribution (RM03/TS11 package system)

- a. This procedure transfers the diagnostic media from the TS11 magtape to the system device DRA0:.
- b. Bootstrap the newly created VMS system and log into the system manager's account. Perform the following commands to transfer the magtape distribution to the [SYSMAINT] area.

```
$ MOUNT MSA0: VAXPAX
$ SET DEF SYS$SYSDISK:[SYSMAINT]
$ COPY MSA0:*.* *
$
```

- c. This procedure transfers all the diagnostics on the magtape to the [SYSMAINT] area.

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CHAPTER 7

USING USER ENVIRONMENT TEST PACKAGE (UETP)

The VAX/VMS User Environment Test Package (UETP) is a collection of tests designed to demonstrate that the hardware has been correctly installed, and the software correctly generated. The UETP leads the system through a series of exercises. By the end of the series, most hardware and software components have been requested to perform one or more tasks. The tests show not only that individual components work together as an integrated system but that the newly installed system is capable of doing useful work.

This chapter presents the UETP operating instructions, including:

- How to prepare the system for running the UETP (Paragraph 7.1)
- How to define UETP variables (Paragraph 7.2)
- How to run the whole package (Paragraph 7.3)
- How to run individual UETP test phases (Paragraph 7.4)

7.1 PREPARING THE SYSTEM

The images and command procedures that comprise the UETP are included in the distributed VAX/VMS system. You can run the UETP any time after the system has been generated and booted. This section describes the steps needed to set the system up for running the UETP.

7.1.1 Booting the System

To prepare for the UETP tests, boot the system in the normal manner. Bootstrap instructions are contained in Chapter 6.

7.1.2 Logging In

You can log in from any terminal connected to the system. If you have a choice between a hardcopy terminal and a VDT terminal, consider whether you want a copy of UETP output to the console. Paragraph 7.2.1 discusses output to the terminal in conjunction with the UETP log files.

All UETP files reside in the [SYSTEST] directory on the system disk. To access these files, you must log in under the user name SYSTEST. The password to this account in the distributed system is UETP. Note that because the SYSTEST account has powerful privileges, its password should be changed after the VAX/VMS system has been installed at the customer site. The AUTHORIZE utility, described in the *VAX/VMS System Manager's Guide*, can be used to change account passwords.

For example:

```
<CR>
Username: SYSTEST <CR>
Password:            <CR>
```

where the password is UETP or a password determined by the customer (The system never echoes a string typed in response to the Password: prompt.)

Note that the SYSTEST account must have the following privileges:

CMKRNL	PRMMBX	PHY_IO
DETACH	PRMCEB	VOLPRO
GRPNAM	GROUP	DIAGNOSE
SYSNAM	LOG_IO	

The SYSTEST account also must have the following quota allowances:

ASTLM:10
DIOLM:12
BIOLM:12
TQCNT:20

In the system distributed by DIGITAL, the SYSTEST account already has these privileges and quotas assigned to it. To check that they remain assigned, issue the following two commands:

\$ SHOW PROCESS/PRIVILEGES <CR>
\$ SHOW PROCESS/QUOTAS <CR>

In response to each command, the terminal displays all the privileges or all the quotas in effect for the current account. If the privileges and quotas listed above are not present, run the AUTHORIZE utility to add them (The *VAX/VMS System Manager's Guide* describes the AUTHORIZE utility.)

The UETP tests can run while the system is processing other work; however, you obtain better results if the tests run in isolation. For example, the UETP cannot test any device that is allocated to another process.

7.1.3 Preparing Devices

After logging in, you must set up all the devices to be tested. For quick reference, each subsection below concludes with a summary of the preparatory steps.

7.1.3.1 Setting Up Disk Drives – For each disk drive in the system, perform the following steps:

- Provide a disk that does not contain any data worth preserving (i.e., a scratch disk) and start up the drive. If the disk has not been initialized, use the INITIALIZE command to do so. For example:

\$ INITIALIZE/DATA CHECK DMA0: TEST1 <CR>

This command initializes a disk on a RK07 drive (DMA0:) and assigns the volume label TEST1 to the disk. Table 7-1 lists the codes for the various device types.

Note that all volumes must have unique labels.

- Issue a MOUNT command to connect the disk to the file system. For example:

MOUNT/SYSTEM DMA0: TEST1 <CR>

This command mounts the volume labeled TEST1 on the drive DMA0:. The qualifier /SYSTEM indicates that you are making the volume available to all users in the system.

- If the volume does not contain the directory [SYSTEST], issue a CREATE command to set it up. The UETP uses this directory when testing the disk. For example:

\$ CREATE/DIRECTORY DMA0: [SYSTEST] <CR>

Table 7-1 Device Codes

Mnemonic	Device Type
DB	RP04, RP05, RP06 disk
DD	TU58 cassette
DM	RK07 disk
DL	RL02 disk
DR	RM03 disk
DY	RX02 disk
LP	Lineprinter
MS	TS04 magnetic tape
MT	TE16, TU45, TU77 magnetic tape
TT	Interactive terminal

You should verify that SYSTEST has the necessary privileges and quotas assigned. Refer to Paragraph 7.1.2 for this procedure.

NOTE

The TU58 cassette is not autoconfigured in the system. In order to identify it to the system and to load its driver, you must execute certain SYSGEN commands. Refer to Paragraph 6.11.1 for instructions on how to connect the TU58 cassette to the system by means of the SYSGEN utility.

Summary:

Physically mount a scratch disk
 Start up the drive
 Issue one or more of the following commands as required:

\$ INITIALIZE/DATA CHECK device-name: label <CR>
\$ MOUNT/SYSTEM device-name: label <CR>
\$ CREATE/DIRECTORY device-name: [SYSTEST] <CR>

7.1.3.2 Setting Up Magnetic Tape Drives – For each magnetic tape drive, perform the following steps:

- Physically mount a write-enabled scratch tape at least 600 feet long.
- Turn on power to the device.
- Position the tape at the BOT marker.
- Press the ONLINE switch.

7.1.3.3 Setting Up Terminals and Lineprinters – In order to be tested by the UETP, terminals and lineprinters must be powered up and on-line to the system. In addition, there must be an adequate paper supply. The amount of paper required depends on the number of UETP runs that you intend to initiate. For each run, both a lineprinter and a terminal require two pages.

In addition, check that the terminals are all set to the correct baud rate and are assigned appropriate characteristics.

Summary:

- Turn power on to the device
- Check paper supply if the device produces hardcopy
- Press the ONLINE switch
- Check baud rates and terminal characteristics

7.1.3.4 Other Devices – The UETP does not test the following devices; their status has no effect on UETP execution:

- Card readers
- Network devices (DMC11s)
- Null devices
- Dialup terminal lines
- Nonstandard devices

Furthermore, the UETP does not test the console terminal or the console device. If you are able to boot the system, log in, and start the UETP; you have shown that these devices are usable.

7.2 DEFINING UETP VARIABLES

This section explains several variables that you must define each time you run the entire UETP package. These UETP variables determine:

- The amount of information to be output to the console
- The number of users to be simulated by the UETP in the system load test
- The number of consecutive runs to be made by the UETP

You decide how much information should be output to the console by including or omitting the /OUTPUT qualifier on the call to the UETP. The remaining three variables are defined by your answers to three questions that the UETP asks when it starts up.

7.2.1 The Console Log

To initiate the UETP, issue a call to the UETP master command procedure as follows:

\$ @UETP [/OUTPUT=filespec] <CR>

If you do not specify the /OUTPUT qualifier, the UETP proceeds to send all its output to the console, which, in this context, is the terminal from which you issued the call. In most cases, however, it is more convenient for the UETP to write most of its output to a disk file. Furthermore, if you run the UETP from a hardcopy terminal, the typing of all the output considerably slows down the tests. This slowdown is multiplied if you request continuous UETP runs from a hardcopy terminal.

By appending the /OUTPUT qualifier to the UETP call, you request a short console log. The UETP then creates an output file, with the name you specified, on the system disk in the [SYSTEST] directory. During the run, the UETP displays status information at the console such as error messages and notifications of the beginning and ending of each phase. This information enables you to determine whether the UETP is proceeding normally.

If the short console log indicates a problem, you can examine the output file for further information. This disk file contains most of the output generated by various phases of the UETP, plus the status information displayed at the console. Some phases have additional separate output files. For example, the load test generates a large amount of information which in itself is not very significant. This information is written to a file called UETPLOG.LOG (Paragraph 7.3.2).

7.2.2 The Load Test

The UETP displays the following prompt; your answer to the prompt (n) determines the number of detached processes to be created by the load test.

ENTER NUMBER OF LOAD TEST USER [D]:n <CR>

Each detached process executes a command procedure and thus simulates a user entering commands from a terminal. The purpose of the test is to create a situation in which each process is competing with other processes for system resources. The console displays a message when each process begins and ends so you can determine the number of currently active simulated users. Each process is deleted when it finishes its command procedure.

The maximum number of users that you should specify depends on the amount of memory in your VAX/VMS system. Table 7-2 provides a guideline for selecting the number of users appropriate to the amount of memory available to you.

7.2.3 Single-Run Versus Continuous UETP Execution

The UETP displays the following prompt; your response (n) determines the number of runs it makes.

ENTER NUMBER OF COMPLETE UETP RUNS [D]:n <CR>

The UETP can be run as a quick check that the system is working, or it can be repeated over and over to see how the system responds to continuous use over a period of time. If you type 1 in response to the above question, the UETP stops after completing its initial run. If you specify a number greater than 1, the UETP continuously restarts itself until it completes the number of runs specified.

When you intend to specify multiple UETP runs, be sure to request a short console log (Paragraph 7.2.1), especially if you are working from a hardcopy terminal. You should also ensure that the paper supply of all lineprinters and hardcopy terminals to be tested lasts through all the test runs.

Table 7-2 Guideline for Selecting Number of Load Test Users

System	Size of Memory	Number of Load Test Users
RP-Based	512K	20
	640K	25
	768K	30
	896K	35
	1 megabyte	40
RK-Based	512K	12
	640K	15
	768K	18
	896K	21
	1 megabyte	25

7.3 RUNNING THE ENTIRE UETP

The following dialogue shows how to initiate one or more complete UETP runs.

```
$ @UETP [/OUTPUT=filespec] <CR>
*** WELCOME TO UETP V2.0 BUILT 20-SEPT-1979***

VAX/VMS UETP STARTED: mm/dd/yy hh:mm

ENTER NUMBER OF LOAD TEST USERS [D]:n <CR>
ENTER NUMBER OF COMPLETE UETP RUNS [D]:n <CR>
```

When you have entered the first line, optionally specifying a short console log, the UETP responds by asking the three questions shown (Refer to Paragraphs 7.2.2, 7.2.3, and 7.2.4 for explanations of these questions.) After you have answered the third question, the UETP initiates its sequence of tests. The tests run to completion with no further input.

7.3.1 Using CTRL/Y and CTRL/C

The control characters CTRL/Y and CTRL/C allow you to interrupt and terminate UETP execution before it completes normally.

7.3.1.1 CTRL/Y – CTRL/Y interrupts the current UETP test and temporarily returns control to the command language interpreter. While the test is interrupted, you can issue a subset of system commands; this subset is defined in the *VAX/VMS Command Language User's Guide*. You then either terminate the test by typing STOP or continue the test from the point of interruption by typing CONTINUE. If you type STOP, the entire UETP aborts and control returns to the command language interpreter.

Note that CTRL/Y does not affect detached processes already created by the interrupted test phase. For example, the device test creates detached processes to handle individual controllers. When you press CTRL/Y during the device test, the individual tests already in progress continue uninterrupted, even if you then type STOP to abort the test phase itself. To stop a detached process, you must first obtain its Process Identification Number (PID) by typing SHOW PROCESS <CR>. Then, substituting this number for PID, type STOP/ID = pid <CR>.

7.3.1.2 CTRL/C – Several UETP test phases react to CTRL/C by cleaning up all activity and terminating immediately. The tests that have enabled CTRL/C in this way display the following message as they start to run:

```
%UETP-I-ABORTC, 'testname' to abort this test, type ^C
```

You cannot continue a test phase after you press CTRL/C to stop it; the UETP continues on to the next test in the master command procedure. Note that CTRL/C also stops any detached processes already created by the current test phase.

7.3.2 UETP Log Files

At the end of a successful single or multiple pass of the UETP package, the [SYSTEST] directory on the system disk contains two files, UETPLOG.LOG and SSLOG.LOG. It will contain three if you specified the optional output file in the call to UETP (i.e., @UETP/OUTPUT=filespec). The following list describes each log file.

- filespec (that is, @UETP/OUTPUT=filespec) – An optional log created if you request an output file in the call to the UETP. This file contains all the information displayed at the terminal as well as information that describes the progress of the tests in somewhat greater detail.

- UETPLOG.LOG – A large log file that is a concatenation of individual log files from the following tests:
 I/O device tests
 Native mode utility tests
 System load test
 Compatibility mode tests
 SORT tests
- SSLOG.LOG – A log file created by the native mode system services test. This file contains information on the testing of each system service.
- UNATIVE.LOG – A log file containing the output from the native mode utility test. UETPLOG.LOG includes this file.
- UCOMP.LOG – A log file containing the output from the compatibility mode test. UETPLOG.LOG includes this file.

In addition to the files described briefly above, files called LOAD.LOG and LOGP.LOG are also present. These files originate from the system load test and the I/O device test respectively. Both these tests create a variable number of detached processes and each detached process generates its own log file, a version of LOAD.LOG or LOGP.LOG. At the end of a pass, the UETP concatenates all the LOAD.LOG files and all the LOGP.LOG files; the concatenated files become part of UETPLOG.LOG. The UETP then purges the individual load test and device test logs so that only the highest versions of LOAD.LOG and LOGP.LOG remain.

If a UETP run does not complete normally, UETP will be unable to clean up its files; in this event, the [SYSTEST] directory may contain other log files. These log files are ordinarily concatenated and placed within UETPLOG.LOG. If, however, they appear on the system disk, they may be used for error checking, but they must be deleted before running any new tests. You may delete them yourself or rerun the entire UETP, which, when it starts up, checks for old log files and deletes them.

The following is a listing and brief description of these temporary log files:

- UNATIVE.LOG – A log file containing the output from the native mode utility test.
- UNCOMP.LOG – A log file containing the output from the compatibility mode test.
- LOAD.LOG – A log file containing output from the system load test. This test creates a variable number of detached processes, each of which generates a version of the LOAD.LOG file.
- LOGP.LOG – A log file containing output from the device tests. These tests also create detached processes for each device, so there will be a version of LOGP.LOG for each device.

NOTE

When outputting UETP logs to the lineprinter, use the PRINT command or the PIP utility.

7.4 A SUCCESSFUL UETP RUN EXAMPLE

Username: SYSTEST
Password:

Welcome to VAX/VMS Version V2.0

\$ SHOW PROCESS/PRIVILEGES

12-JUN-1980 22:13:39.03 _OPA0: User : SYSTEST

Process Privileges:

CMKRNL	may change mode to kernel
CMEXEC	may change mode to exec
SYSNAM	may insert in system logical name table
GRPNAM	may insert in group logical name table
DETACH	may create detached processes
LOG_IO	may do logical I/O
GROUPE	may affect other processes in same group
PRMCEB	may create permanent common event clusters
PRMMBX	may create permanent mailbox
TMPMBX	may create temporary mailbox
OPER	may perform operator functions
NETMBX	may create network device
VOLPRO	may override volume protection
PHY_IO	may do physical I/O
MOUNT	may execute mount ACP functions
SYSPRV	may access objects via system protection

\$ SHOW PROCESS/QUOTAS

12-JUN-1980 22:14:10.01 _OPA0: User : SYSTEST

Process Quotas:

Account name: SYSTEM			
CPU limit :	Infinite	Direct I/ O limit:	12
Buffered I/O byte count quota	4096	Buffered I/O limit:	12
Timer queue entry quota :	20	Open file quota:	20
Paging file quota:	10000	Subprocess quota:	2
Default page fault cluster :	32	AST limit :	10

\$ INITIALIZE/DATA CHECK DMA0: TEST1

\$ MOUNT/SYSTEM DMA0: TEST1

%MOUNT-I-MOUNTED, TEST1 mounted on _DMA1:

@UETP/OUTPUT=LOG.LOG

*** WELCOME TO UETP V2.0 ***

UETP STARTING AT 2-SEP-1980 16:00:25.88

ENTER NUMBER OF LOAD TEST USERS [D]:6

ENTER NUMBER OF COMPLETE UETP RUNS [D]:1

```
%UETP-I-BEGIN, UETINIT00 beginning at 2-SEP-1980 16:00:32.87
%UETP-I-ENDED, UETINIT00 ended at 2-SEP-1980 16:00:33.32
%UETP-I-BEGIN, UETINIT01 beginning at 2-SEP-1980 16:00:33.91
%UETP-I-DENOSU, UETINIT01 device OPA is not supported
%UETP-I-DENOSU, UETINIT01 device MBA is not supported
%UETP-I-DENOSU, UETINIT01 device NLA is not supported
%UETP-I-DENOSU, UETINIT01 device CSA is not supported
%UETP-I-ENDED, UETINIT01 ended at 2-SEP-1980 16:00:37.37
```

***** PERIPHERAL DEVICE TEST *****

```
%UETP-I-BEGIN, UETPDEV01 beginning at 2-SEP-1980 16:00:40.74
%UETP-I-ABORTC, UETPDEV01 to abort this test, type ^C
%UETP-I-BEGIN, test of controller DMA beginning at 16:00:44.64
%UETP-I-BEGIN, test of controller LPA beginning at 16:00:47.63
%UETP-I-BEGIN, test of controller MSA beginning at 16:01:03.18
%UETP-I-BEGIN, test of controller TTA beginning at 16:01:11.27
%UETP-I-ENDED, test of controller DMA ended at 16:01:11.51
%UETP-I-ENDED, test of controller LPA ended at 16:01:15.41
%UETP-I-ENDED, test of controller TTA ended at 16:01:30.31
%UETP-I-ENDED, test of controller DMA ended at 16:02:28.33
%UETP-I-ENDED, UETPDEV01 ended at 2-SEP-1980 16:02:28.46
```

***** NATIVE MODE TESTS *****

```
**** VAX-11 RMS tests beginning at 2-SEP-1980 16:02:29.13 ****
%RMSTST-I-BEGIN, BLOCK I/O TESTS beginning at 16:02:30.09
%RMSTST-I-ENDED, BLOCK I/O TESTS ended at 16:02:34.46
%RMSTST-I-BEGIN, XAB TESTS beginning at 16:02:34.86
%RMSTST-I-ENDED, XAB TESTS ended at 16:02:36.44
%RMSTST-I-BEGIN, SEQUENTIAL TESTS beginning at 16:02:36.54
%RMSTST-I-ENDED, SEQUENTIAL TESTS ended at 16:03:14.95
%RMSTST-I-BEGIN, RELATED FILENAME AND DIRECTORY TESTS beginning at 16:03:15.08
%RMSTST-I-ENDED, RELATED FILENAME AND DIRECTORY TESTS ended at 16:03:16.87
%RMSTST-I-BEGIN, RELATIVE TESTS beginning at 16:03:17.02
%RMSTST-I-BEGIN, LOCKING TESTS beginning at 16:03:19.17
%RMSTST-I-ENDED, LOCKING TESTS ended at 16:03:19.80
%RMSTST-I-BEGIN, LOCKING TESTS beginning at 16:03:21.65
%RMSTST-I-ENDED, LOCKING TESTS ended at 16:03:22.15
%RMSTST-I-BEGIN, LOCKING TESTS beginning at 16:03:24.00
%RMSTST-I-ENDED, LOCKING TESTS ended at 16:03:24.47
%RMSTST-I-ENDED, RELATIVE TESTS ended at 16:03:24.57
%RMSTST-I-BEGIN, INDEXED TEST beginning at 16:03:24.68
%RMSTST-I-ENDED, INDEXED TEST ended at 16:05:54.45
%RMSTST-I-BEGIN, COPY beginning at 16:05:55.13
%RMSTST-I-ENDED, COPY ended at 16:05:55.96
%RMSTST-I-BEGIN, APPEND beginning at 16:05:56.11
%RMSTST-I-ENDED, APPEND ended at 16:05:56.72
%SYSTEM-W-DEVALLOC, device already allocated to another user
%INIT-F-DEVALLOC, device already allocated to another user
**** VAX-11 RMS tests ending at 2-SEP-1980 16:06:05.31 ****
```

***** VMS SYSTEM SERVICES *****

```
%UETP-I-BEGIN, UETNATV01 beginning at 2-SEP-1980 16:06:06.21
```

```

%UETP-I-ABORTC, UETNATV01 to abort this test, type ^C
%UETP-I-TEXT, THE FOLLOWING MSGS ARE PART OF THE $BRDCST TEST ... PLEASE IGNORE
VAX/VMS VAX/VMS VAX/VMS VAX/VMS VAX/VMS VAX/VMS VAX/VMS VAX/VMS VAX/VMS VAX/VMS
VAX/VMS VAX/VMS VAX/VMS VAX/VMS VAX/VMS VAX/VMS VAX/VMS VAX/VMS VAX/VMS VAX/VMS
VAX/VMS VAX/VMS VAX/VMS VAX/VMS VAX/VMX VAX/VMS VAX/VMS VAX/VMS VAX/VMS VAX/VMS
VAX/VMS VAX/VMS VAX/VMS VAX/VMS VAX/VMX VAX/VMS VAX/VMS VAX/VMS VAX/VMS VAX/VMS
VAX/VMS VAX/VMS VAX/VMS VAX/VMS VAX/VMX VAX/VMS VAX/VMS VAX/VMS VAX/VMS VAX/VMS
VAX/VMS VAX/VMS VAX/VMS VAX/VMS VAX/VMX VAX/VMS VAX/VMS VAX/VMS VAX/VMS VAX/VMS
VAX/VMS VA
VAX/VMS VAX/VMS VAX/VMS VAX/VMS VAX/VMX VAX/VMS VAX/VMS VAX/VMS VAX/VMS VAX/VMS
VAX/VMS VAX/VMS VAX/VMS VAX/VMS VAX/VMX VAX/VMS VAX/VMS VAX/VMS VAX/VMS VAX/VMS
VAX/VMS VAX/VMS VAX/VMS VAX/VMS VAX/VMX VAX/VMS VAX/VMS VAX/VMS VAX/VMS VAX/VMS
VAX/VMS VA
VAX/VMS VAX/VMS VAX/VMS VAX/VMS VAX/VMX VAX/VMS VAX/VMS VAX/VMS VAX/VMS VAX/VMS
VAX/VMS VAX/VMS VAX/VMS VAX/VMS VAX/VMX VAX/VMS VAX/VMS VAX/VMS VAX/VMS VAX/VMS
VAX/VMS VAX/VMS VAX/VMS VAX/VMS VAX/VMX VAX/VMS VAX/VMS VAX/VMS VAX/VMS VAX/VMS
VAX/VMS VA
VAX/VMS VAX/VMS VAX/VMS VAX/VMS VAX/VMX VAX/VMS VAX/VMS VAX/VMS VAX/VMS VAX/VMS
VAX/VMS VAX/VMS VAX/VMS VAX/VMS VAX/VMX VAX/VMS VAX/VMS VAX/VMS VAX/VMS VAX/VMS
VAX/VMS VAX/VMS VAX/VMS VAX/VMS VAX/VMX VAX/VMS VAX/VMS VAX/VMS VAX/VMS VAX/VMS
VAX/VMS VA
%UETP-I-TEXT, NO MORE $BRDCST MSGS ... THANK YOU FOR YOUR PATIENCE
%UETP-I-TEXT, UETNATV01 VMS system service errors found is 5
%UETP-I-ENDED, UETNATV01 ended at 2-SEP-1980 16:17:19.30
***** NATIVE MODE SORT TEST *****
*** VAX-11 SORT TESTS BEGINNING AT 2-SEP-1980 16:17:20.5 ***
    VERIFICATION OF SORT TESTS SUCCESSFUL
*** VAX-11 SORT TESTS ENDING AT 2-SEP-1980 16:18:55.48 ***
***** LOAD TEST *****
%UETP-I-BEGIN, UETLOAD01 beginning at 2-SEP-1980 16:18:56.67
%UETP-I-ABORTC, UETLOAD01 to abort this test, type ^C
%UETP-I-USER, UETLOAD01 1 user running
%UETP-I-USER, UETLOAD01 2 users running
%UETP-I-USER, UETLOAD01 3 users running
%UETP-I-USER, UETLOAD01 4 users running

```

```

%UETP-I-USER, UETLOAD01 5 users running
%UETP-I-USER, UETLOAD01 6 users running
%UETP-I-USER, UETLOAD01 5 users running
%UETP-I-USER, UETLOAD01 4 users running
%UETP-I-USER, UETLOAD01 3 users running
%UETP-I-USER, UETLOAD01 2 users running
%UETP-I-ENDED, UETLOAD01 ended at 2-SEP-1980 16:26:56.07

***** COMPATIBILITY MODE TESTS *****

*** COMPATIBILITY MODE TEST BEGIN AT 2-SEP-1980 16:26:56.78 ***
COMPATIBILITY MODE DMP TEST SUCCESSFUL

%MOUNT-I-MOUNTED, UETP mounted on MSA0:
COMPATIBILITY MODE FLX TEST SUCCESSFUL

COMPATIBILITY MODE LBR TEST SUCCESSFUL

COMPATIBILITY MODE PAT TEST SUCCESSFUL

COMPATIBILITY MODE PIP TEST SUCCESSFUL

COMPATIBILITY MODE SLP TEST SUCCESSFUL

COMPATIBILITY MODE SOS TEST SUCCESSFUL

COMPATIBILITY MODE SRT TEST SUCCESSFUL

*** COMPATIBILITY MODE TEST ENDING AT 2-SEP-1980 16:32:31.99 ***

*** RSX-11M EXECUTIVE DIRECTIVE TESTS BEGIN AT 2-SEP-1980 16:32:32.86 ***

*** PRINT TEST ***
ABCDEFGHIJKLMN0PQRSTUVWXYZ0123456789ABCDEFGHIJKLMN0PQRSTUVWXYZ0123456789
ABCDEFGHIJKLMN0PQRSTUVWXYZ0123456789ABCDEFGHIJKLMN0PQRSTUVWXYZ0123456789
ABCDEFGHIJKLMN0PQRSTUVWXYZ0123456789ABCDEFGHIJKLMN0PQRSTUVWXYZ0123456789
ABCDEFGHIJKLMN0PQRSTUVWXYZ0123456789ABCDEFGHIJKLMN0PQRSTUVWXYZ0123456789
%RUN-E-DUPLNAM, duplicate process name

*****
*
*   END OF PASS 1 AT 2-SEP-1980 16:33:12.51
*
*****

*****
*
*   END OF UETP AT 2-SEP-1980 16:33:13.52
*
*****

```

7.5 RUNNING INDIVIDUAL UETP PHASES

When you run the entire UETP, it automatically steps through a sequence of phases that test various parts and functions of the system. Each phase can be run separately so you can test a specific part or function in isolation. Refer to the *VAX/VMS UETP User's Guide* for the operating instructions to run the individual UETP phases.

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CHAPTER 8

VAX-11/750 PREVENTIVE MAINTENANCE

8.1 INTRODUCTION

The preventive maintenance (PM) procedures should be performed at each scheduled PM. It should take two hours to perform the whole PM routine.

8.2 MATERIALS NEEDED

The following materials are needed for the PM routine:

- diagnostics
- scratch TU58 tape
- tape cleaning kit (TUC01)
- vacuum cleaner
- filters (part number 12-12035)

8.3 PM PROCEDURES

1. Clean the TU58 tape drive using the cleaning kit (part number TUC01). Refer to the *TU58 DECtape II Technical Manual* (EK-OTU58-TM-001) for the cleaning procedure.
2. Clean the front and rear door filters of the VAX-11/750 with a vacuum cleaner. If a filter is worn out or damaged, replace it with a new filter (part number 12-12035).
3. Run the following diagnostics to verify the integrity of the VAX-11/750.
 - ECKAX
 - ECKAM (no errors)

Refer to the *VAX-11/750 Diagnostics System Overview Manual* (EK-VXD75-UG-001) for diagnostic procedures.

4. Clean off the cabinets with a mild soapy solution.

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APPENDIX A OPTIONAL MEMORY AND BATTERY BACKUP

A.1 OPTIONAL MEMORY INSTALLATION

The VAX-11/750 may contain as many as eight 256KB memory array cards in Slots 11 through 18. The system will be shipped with at least two memory array cards installed. To install additional memory array cards, insert each card into the backplane sequentially, starting with the first available slot and proceeding up to Slot 18. Should any memory array cards be inserted into noncontiguous memory array slots, a red fault LED will light on the memory controller (Slot 10).

A.2 BATTERY BACKUP INSTALLATION

The battery backup installation procedure is as follows:

1. Position and cable the battery as illustrated in the engineering drawing VAX-11/750 Cabinet Assembly (Document Number E-AD-7016707). Refer also to Paragraph 3.28 of the *VAX-11/750 H7104 Power System Technical Description* (EK-PS750-TD-001).
2. Verify the functionality of the H7112 battery backup as described in Paragraph 5.2 of the *VAX-11/750 H7104 Power System Technical Description* (EK-PS750-TD-001).

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APPENDIX B

DZ11

B.1 GENERAL

The basic VAX-11/750 includes one DZ11-AA consisting of the following:

- one M7819 UNIBUS, 8 line EIA serial multiplexer
- one H317-E 16 line EIA distribution panel
- one H325 RS232 test connector
- one H3271 null modem cross connector
- one BC05W-7 7 foot ribbon cable

There is mounting space available in the CPU cabinet for one additional H317 distribution panel. This distribution panel may be either an H317-E for EIA lines, or an H317-F for 20 ma loop lines.

B.1.1 Add-On Hardware

A minimal add-on hardware installation will support an additional eight EIA lines. This option is called a DZ11-BA and consists of:

- one M7819
- one BC05W-7
- one H3271

To install the DZ11-BA option into a VAX-11/750 CPU cabinet, refer to Paragraph B.2.

The next level of add-on hardware installation would support an additional sixteen EIA lines, for a total of twenty-four. This option is called a DZ11-EA and consists of:

- two M7819(s)
- one H317-E
- one H325
- one H3271
- two BC05W-7(s)

To install the DZ11-EA option, first install the H317-E. Refer to Paragraph B.3, then follow the DZ11-BA instructions in Paragraph B.2.

B.2 INSTALLING DZ11 MODULES

1. Remove the module(s) and the BC05W-7 cable(s) from their shipping container and inventory the contents.
2. Run the BC05W-7 cable(s) over the top CPU cable trays (Figure B-1).

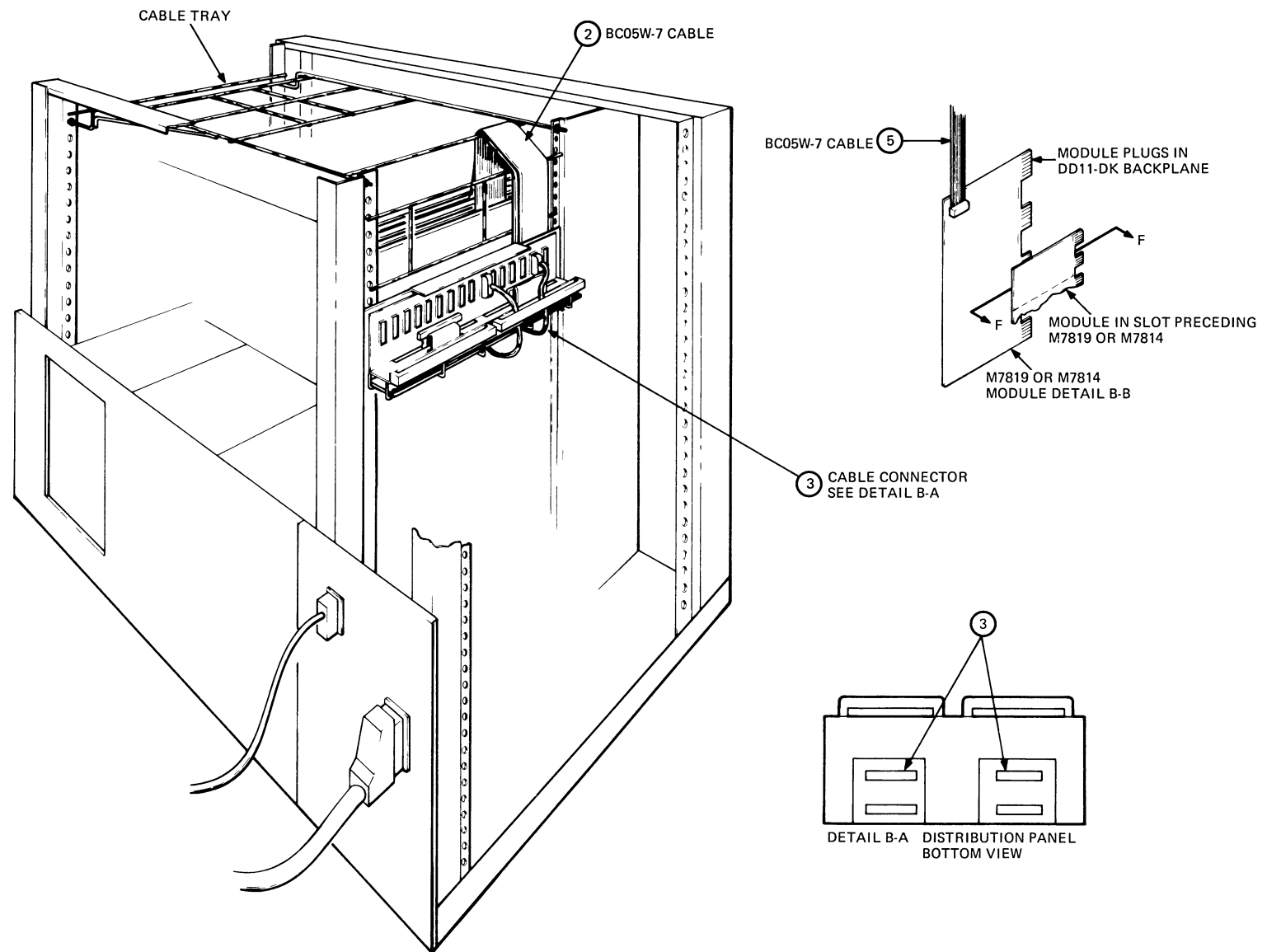


Figure B-1 CPU with Distribution Panel

3. Connect the BC05W-7 cable for the first DZ11 to the lower right cable connector of the DZ11 distribution panel.

Connect the second BC05W-7 cable for the second DZ11 to the lower left cable connector of the DZ11 distribution panel. Refer to Figure B-1 (Detail B-A).

4. This step only applies when an optional distribution panel is installed. Refer to Paragraph B.3 for the optional distribution panel installation procedure. Connect the BC05W-7 cable for the third DZ11 to the lower right cable connector of the optional distribution panel. Connect the BC05W-7 cable for the fourth DZ11 to the lower left cable connector. Refer to Figure B-3 (Detail View B-C).
5. Set the bus address and vector address switches on the DZ11(s) to correspond with the manufacturing configuration sheet. Use the procedure outlined in the *DZ11 User's Guide* (EK-DZ110-UG-002).
6. Remove the G727 grant continuity module for the DZ11 designated slot(s). Refer to the manufacturing configuration sheet for slot location(s).
7. Connect the BC05W-7 cable(s) to the DZ11 module(s). Refer to Figure B-1 (Detail B-B).
8. Plug the DZ11 module(s) into the DD11-DK backplane.

B.3 INSTALLING THE OPTIONAL DISTRIBUTION PANEL AND DZ11

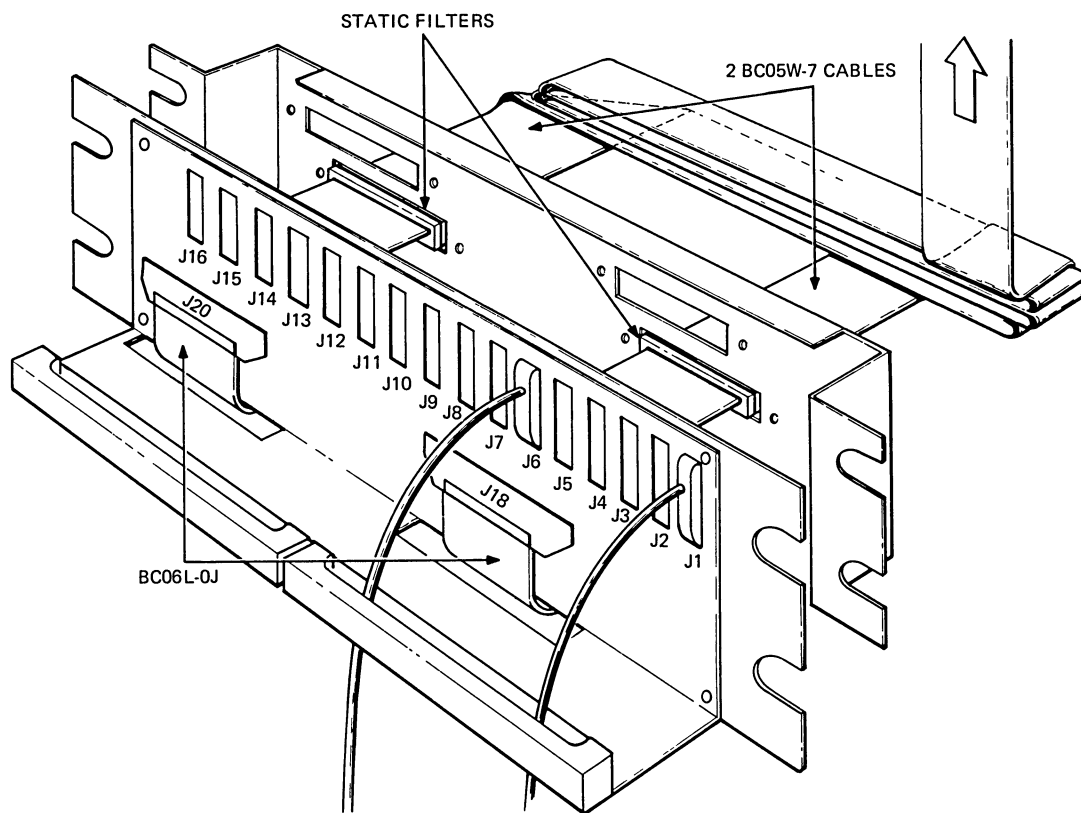
1. Remove the distribution panel (H317-E), static filter(s) (H7004C), DZ11(s) (M7819), two BC06L-0J cables, and BC05W-7 cable(s) from their shipping container.
2. Install the BC06L cable(s), filter(s), and BC05W-7 cable(s) as shown in Figure B-2.
3. Screw the two left side screws half way in (Figure B-3).
4. Place the distribution panel into position and screw in the two right side screws. Tighten the two left side screws.
5. Place the distribution panel cover over the distribution panel and tighten the two screws.

B.4 FIELD ACCEPTANCE TESTING

Field acceptance testing is intended to demonstrate the performance of the DZ11 to the customer prior to his acceptance of the equipment. Table B-1 shows the diagnostic program used to verify the integrity of the DZ11.

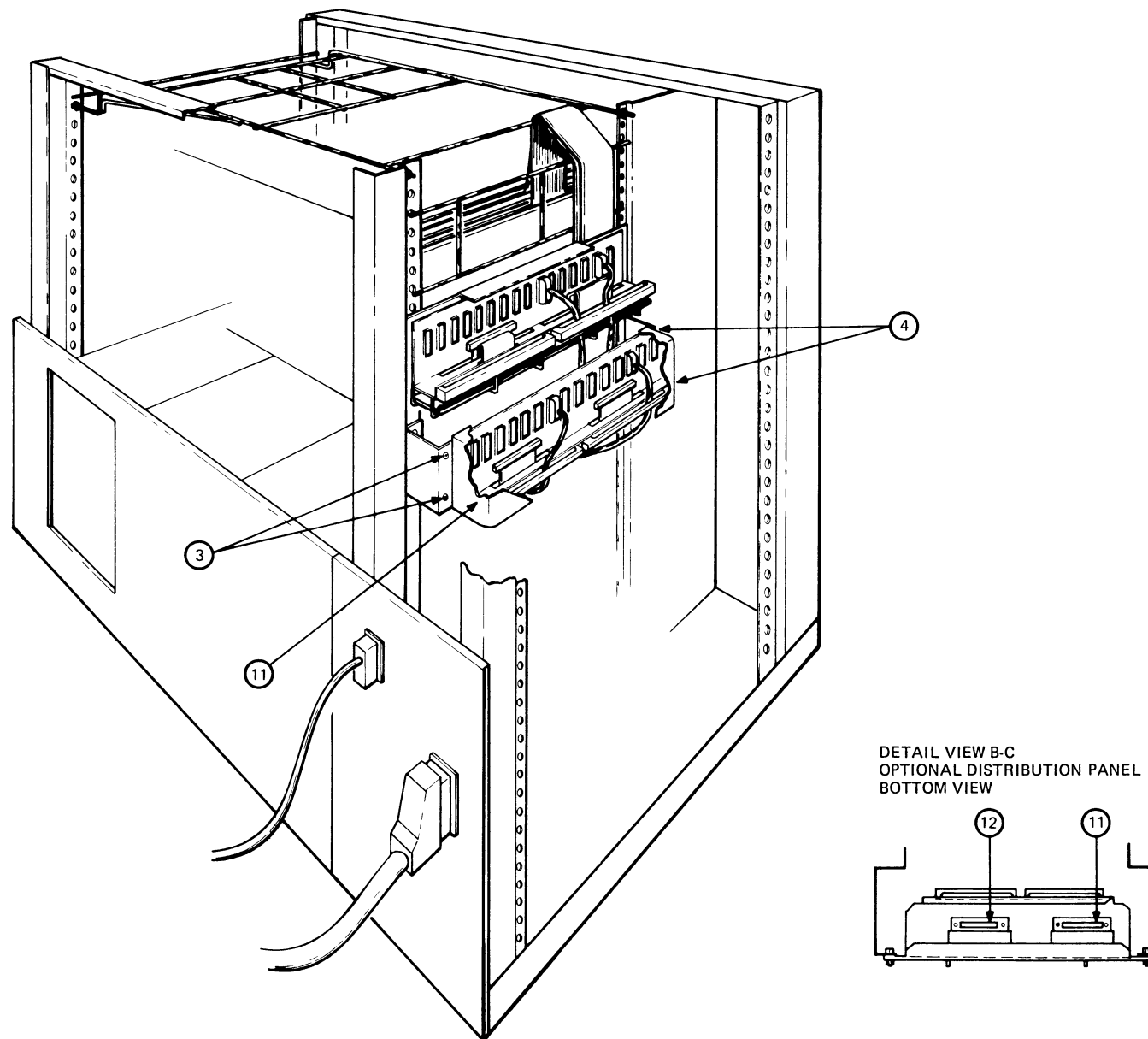
Table B-1 DZ11 Diagnostic Program

MAINDEC	LEVEL	TITLE
EVDA A	3	VAX DZ11 8 Line Async Mux



TK-6594

Figure B-2 Optional Distribution Panel



TK-6593

Figure B-3 CPU with Optional Distribution Panel

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APPENDIX C

KU750

C.1 GENERAL

The KU750 system option includes the daughter board assembly that attaches to the L0005 CCS module, required hardware, and a TU58 cassette containing the G and H floating math microcode. The KU750 module is an extension of the PROM control store. The dimensions of the KU750 module are 1K X 80 bits. The KU750 control store address range extends from 2000 to 23FF.

There are two methods of entry to the KU750 control store. The first method is to enter the optional control store (OCS) through the SCB vector when bits $\langle 1:0 \rangle = 2$. This entry point, address 2001, is a dedicated microaddress. The second entry method is to execute the extended floating-point math instructions. There are a group of dedicated entry points for these double byte op code instructions.

The OSC interfaces via Common Memory Interconnect (CMI). The CMI is a synchronous interlocked bus that interfaces the CPU, UNIBUS, MASSBUS, RDM, KU750, and memory. The KU750 interface to the CMI is only 20 bits wide; therefore, 4 longword writes are required to pack one VAX-11/750 microinstruction into OSC. The KU750 responds to physical addresses from F00000 to F03FFC in the CMI I/O address space.

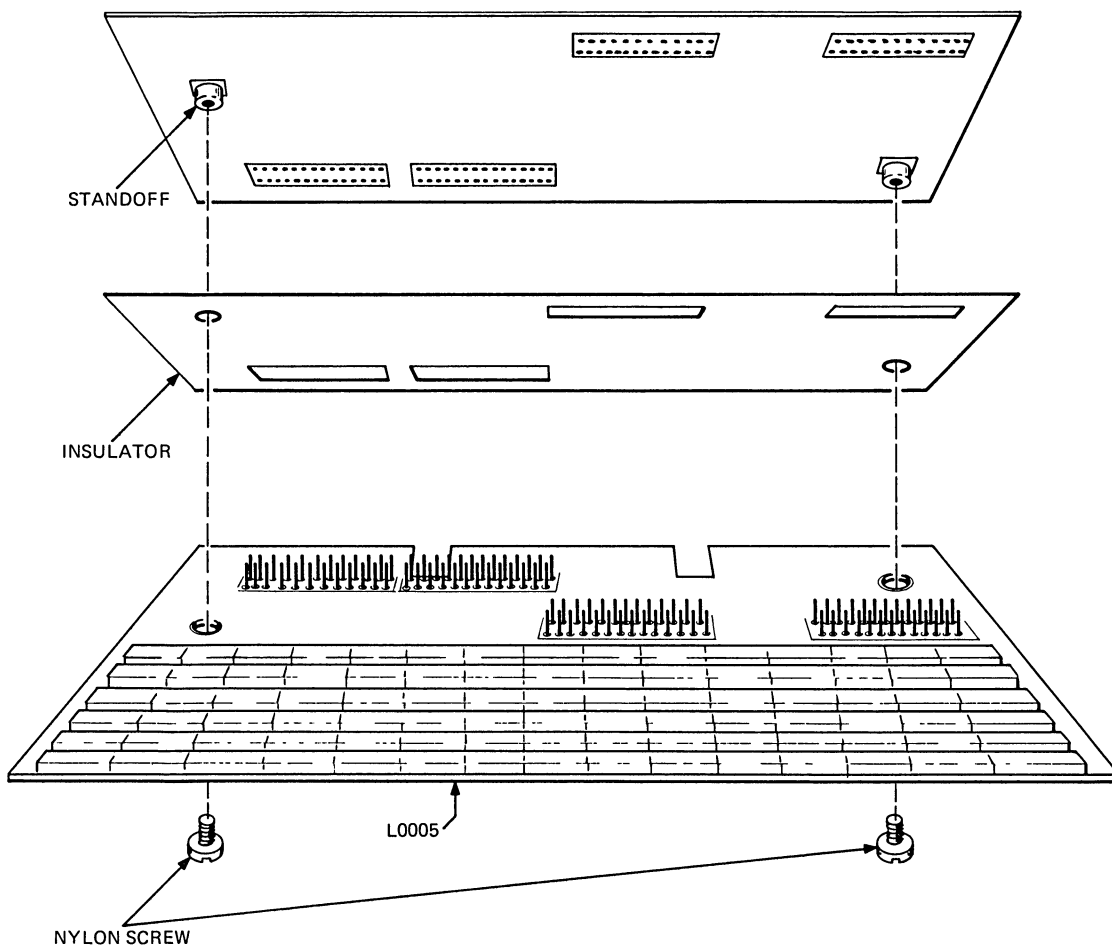
The OSC does not generate or check control store parity on the data written into it. Transmitted and received microcode can be compared after the optional control store is loaded. The microcode input must be generated using the VAX-11/750 machine definitions contained in the MICRO2 output listing (ECOAB in the VAX-diagnostic library). The TU58 cassette contains the necessary command procedures and software to complete the installation.

C.2 KU750 MODULE INSTALLATION

Complete the following steps to install the module.

1. Shut down system in an orderly manner by logging on and executing [SYS-EXE]SHUTDOWN.COM.
2. When shutdown is complete, remove power from system by turning the keyswitch to the OFF position.
3. Remove the L0005 from the CPU and inspect it for a jumper on pins 16 and 18 of J4. Remove this jumper. Also inspect the CPU backplane and ensure that there is no wire from 500B44 to 500B48. If there is a wire wrap between these two pins, remove it. The jumper or the wire wrap accomplish the same functions; i.e., both ground CS ADD $\langle 13 \rangle$ to prevent "accidental" entry to OCS if there is no module present.

4. Install the nonflammable insulator over the four groups of pins. Refer to Figure C-1.
5. Make certain that all the pins on the L0005 are straight and aligned properly with the rest.
6. Place one side of the KU750 module over the pins and align the module for insertion.
7. Once aligned, press the OCS module firmly into place.
8. Insert the nylon screws as shown in Figure C-1 and tighten until snug. Do not use excessive force or the screw head will tear off.
9. Install L0005 into the CPU and verify that there is no contact between side one of the OCS, and side 2 of the L0004 module.
10. Restore power to the system.



TK-6595

Figure C-1 Optional Control Store Installation

C.3 KU750 MODULE VERIFICATION

1. THE OCS module is tested by the diagnostic ECKAX. Bring the system up in standalone mode under the DIAGNOSTIC SUPERVISOR.
2. Test the OCS module by running tests 5 and 6 of ECKAX. Follow Example C-1 to attach the CPU. In Example C-1 the "23FF" parameter is the optional control store last address.
3. If either of these tests fail, verify that the installation is correct and/or replace the KU750 module.

```
>>>B/10
ZZ
```

```
DIAGNOSTIC SUPERVISOR. ZZ-ECSAA-6.1-175 10-APR-1981 22:15:43
DS> ATTACH KA750 CMI KAO NO NO YES 23FF 0
DS> SET TRA
DS> SEL ALL
DS> RUN ECKAX/TE:5:6
```

```
.. PROGRAM: VAX 11/750 Specific CPU Cluster Exerciser - ZZ-ECKAX-3.1 , REV 3.1, '9 TESTS, A1 22
TESTING: _KAO
```

```
TEST 5: WCS Memory Test
TEST 6: WCS Execution Test
.. END OF RUN. 0 ERRORS DETECTED. PASS COUNT: 1. TIME: 10-APR-1981 22:15:43.34
DS>
```

Example C-1 Attaching the CPU

C.4 KU750 SOFTWARE INSTALLATION AND TESTING

The VMS utility called KU750UTL.EXE loads the G and H floating-point microcode into the OCS. KU750UTL with the G and H floating-point microcode binary files and related routines are installed into the operating system the same way optional software is installed. The command procedure in the [SYSUPD] area called VMSUPDATE.COM automatically loads the KU750 optional software into the appropriate directories. The tape has a label of KU750KIT and a command procedure of the same name. The tape must be physically in the TU58 tape drive when VMSUPDATE is invoked. VMSUPDATE reads the tape and gets the KU750KIT command procedure which installs the G and H software into the appropriate places on the system. When KU750KIT completes execution, it returns control back to VMSUPDATE. VMSUPDATE then optionally terminates at the operator's request. Once the installation is complete, the package may be tested a number of ways. Next, the customer must decide what type of power failure recovery is desired. Then the command procedures that invoke the desired recovery may be created.

C.4.1 Software Installation

1. Load the KU750KIT tape into the console tape drive CS1:.
2. Boot the system and log into the FIELD SERVICE account.
3. Set the default directory to SYS\$SYSDISK: [SYSUPD].

4. Invoke the VMSUPDATE command procedure by typing...

\$ @VMSUPDATE

5. Respond to the questions and the procedure will run on its own until completion.
6. Refer to Example C-2 for the installation command procedures that will type out on the terminal. This account must have privileges to run the KU750 utility.

```
Username: SYSTEM
Password:
Welcome to VAX/VMS Version X2.2
$ set def sys$sysdisk:[sysupd]
$ @vmsupdate
```

VMS Update Procedure

This command procedure performs VAX/VMS software updates and optional software installations for VAX/VMS Release 2. During this sequence, the standard console medium will not be present in the console drive. Therefore, the system may be vulnerable to a power failure or other fatal crash. If a system crash should occur during this period the update sequence can be restarted at the beginning of the first incomplete update.

Dismount the current console medium.
ZSYSTEM-F-DEVNOTMOUNT, device is not mounted

Please place the first volume in the console drive

```
Are you ready to continue?: yes
ZMOUNT-I-MOUNTED, KU750KIT      mounted on _CSA1:
$COPY/LOG SYS$KIT:*. *      [SYSUPD]*
ZCOPY-S-COPIED, _CSA1:[SYSUPD]EXAMPLE.COM;2 copied to _DRA0:[SYSUPD]EXAMPLE.COM;14 (2 blocks)
ZCOPY-S-COPIED, _CSA1:[SYSUPD]GHFLOAT.BIN;6 copied to _DRA0:[SYSUPD]GHFLOAT.BIN;6 (21 blocks)
ZCOPY-S-COPIED, _CSA1:[SYSUPD]GHFLOAT.ULX;5 copied to _DRA0:[SYSUPD]GHFLOAT.ULX;15 (96 blocks)
ZCOPY-S-COPIED, _CSA1:[SYSUPD]GHGHOFF.BIN;1 copied to _DRA0:[SYSUPD]GHGHOFF.BIN;13 (21 blocks)
ZCOPY-S-COPIED, _CSA1:[SYSUPD]KU750BIN.COM;3 copied to _DRA0:[SYSUPD]KU750BIN.COM;15 (1 block)
ZCOPY-S-COPIED, _CSA1:[SYSUPD]KU750BLD.COM;2 copied to _DRA0:[SYSUPD]KU750BLD.COM;14 (1 block)
ZCOPY-S-COPIED, _CSA1:[SYSUPD]KU750DRV.MAR;4 copied to _DRA0:[SYSUPD]KU750DRV.MAR;4 (23 blocks)
ZCOPY-S-COPIED, _CSA1:[SYSUPD]KU750DRV.OBJ;1 copied to _DRA0:[SYSUPD]KU750DRV.OBJ;1 (4 blocks)
ZCOPY-S-COPIED, _CSA1:[SYSUPD]KU750IPC.COM;1 copied to _DRA0:[SYSUPD]KU750IPC.COM;1 (1 block)
ZCOPY-S-COPIED, _CSA1:[SYSUPD]KU750KIT.COM;17 copied to _DRA0:[SYSUPD]KU750KIT.COM;18 (3 blocks)
ZCOPY-S-COPIED, _CSA1:[SYSUPD]KU750LNK.COM;3 copied to _DRA0:[SYSUPD]KU750LNK.COM;16 (1 block)
ZCOPY-S-COPIED, _CSA1:[SYSUPD]KU750MAC.COM;2 copied to _DRA0:[SYSUPD]KU750MAC.COM;2 (1 block)
ZCOPY-S-COPIED, _CSA1:[SYSUPD]KU750MDL.MAR;1 copied to _DRA0:[SYSUPD]KU750MDL.MAR;1 (2 blocks)
ZCOPY-S-COPIED, _CSA1:[SYSUPD]KU750MSG.OBJ;3 copied to _DRA0:[SYSUPD]KU750MSG.OBJ;3 (5 blocks)
ZCOPY-S-COPIED, _CSA1:[SYSUPD]KU750OFF.COM;2 copied to _DRA0:[SYSUPD]KU750OFF.COM;14 (1 block)
ZCOPY-S-COPIED, _CSA1:[SYSUPD]KU750OPT.OPT;1 copied to _DRA0:[SYSUPD]KU750OPT.OPT;1 (1 block)
ZCOPY-S-COPIED, _CSA1:[SYSUPD]KU750PRC.MAR;3 copied to _DRA0:[SYSUPD]KU750PRC.MAR;3 (25 blocks)
ZCOPY-S-COPIED, _CSA1:[SYSUPD]KU750PRC.OBJ;1 copied to _DRA0:[SYSUPD]KU750PRC.OBJ;1 (5 blocks)
ZCOPY-S-COPIED, _CSA1:[SYSUPD]KU750TST.COM;7 copied to _DRA0:[SYSUPD]KU750TST.COM;7 (1 block)
ZCOPY-S-COPIED, _CSA1:[SYSUPD]KU750TST.MAR;30 copied to _DRA0:[SYSUPD]KU750TST.MAR;30 (31 blocks)
ZCOPY-S-COPIED, _CSA1:[SYSUPD]KU750TST.OBJ;29 copied to _DRA0:[SYSUPD]KU750TST.OBJ;29 (16 blocks)
ZCOPY-S-COPIED, _CSA1:[SYSUPD]KU750UTL.MAR;19 copied to _DRA0:[SYSUPD]KU750UTL.MAR;19 (76 blocks)
ZCOPY-S-COPIED, _CSA1:[SYSUPD]KU750UTL.OBJ;4 copied to _DRA0:[SYSUPD]KU750UTL.OBJ;4 (19 blocks)
ZCOPY-S-NEWFILES, 23 files created
$!
$DISMOUNT/NOUNLOAD SYS$KIT
$! This command file assembles all types of the load utility
$@KU750MAC
$MACRO KU750MDL+KU750UTL/OBJ=KU750UTL
$MACRO KU750MDL+KU750PRC/OBJ=KU750PRC
$MACRO KU750MDL+KU750DRV/OBJ=KU750DRV
```

Example C-2 Installation Command Procedures
(Sheet 1 of 2)

```

$! This command file links all types of the KU750 load utility
$! All EXEs are created in [SYSEXE]
$! All .MAR,.OBJ (except KU750MSG),.EXE
$! in the running area have been deleted
#@KU750LNK
$LINK KU750UTL,KU750MSG/EXE=[SYSEXE]KU750UTL
$LINK KU750PRC,KU750MSG/EXE=[SYSEXE]KU750PRC
$LINK KU750DRV,KU750OPT.OPT/OPTIONS,-
SYS$SYSTEM:SYS.STB/SELECTIVE_SEARCH/EXE=[SYSEXE]KU750DRV
BASE=0
$LINK-W-USRTFR, Image '[SYSEXE]KU750DRV' has no user transfer address
$DELETE KU750UTL.*;*
$DELETE KU750PRC.*;*
$DELETE KU750DRV.*;*
$DELETE KU750OPT.*;*
$! This command file links the IPC test package
$! for the GHFLOAT installation verification.
#@KU750TST
$LINK KU750TST,KU750MSG/EXE=[SYSEXE]KU750TST
$DELETE KU750TST.OBJ;*
$!
$! This is the test file to run for verification
$!
$COPY KU750IPC.COM [SYSTEST]*
$DELETE KU750IPC.COM;*
$!
$! This copies the GHFLOAT microcode binary file to the
$! correct area
$!
$COPY GHFLOAT.BIN [SYSEXE]*
$!
$! This deletes the file from the running area
$!
$DELETE GHFLOAT.BIN;*
$!
$SET NOVERIFY
At this point it is necessary to select the
appropriate type of loading of UCS for the installation.
EXAMPLE.COM gives sample command files for each type.
The correct type should be built into a file named
GHFLOAT.COM in [SYSMGR] and an entry made in the
SYSTARTUP file i.e., @[SYSMGR]GHFLOAT.COM

All source files for the KU750 utilities are on this
update kit if you wish to modify them.
$SYSTEM-F-DEVNOTMOUNT, device is not mounted

Are there more kits to process?: NO

Please place the system console medium in the console drive.

Are you ready to continue?: YES
$MOUNT-I-MOUNTED, CONSOLE mounted on _CSA1:
Requested update sequence is complete.
$

```

Example C-2 Installation Command Procedures (Sheet 2 of 2)

C.4.2 Software Testing

1. Refer to and perform the DCL commands as shown in Example C-3 for a method to test the system. The account must be a privileged account.
2. The command sequence shows that symbol "CS" is equated to running the KU750UTL.EXE program in the [SYSEXE] area.

```

$ CS==$SYS$SYSTEM:KU750UTL
$ CS [SYSEXE]GHFLOAT.BIN/LOAD/BIN
$ @[SYSTEST]KU750IPC
ZUCSMG-I-INSTOK, GH instructions loaded successfully
$ SET DEF [SYSMAINT]
$ RUN ECSAA
DIAGNOSTIC SUPERVISOR.  ZZ-ECSAA-6.1-175      4-MAR-1981 17:40:48
DS> ATT KA750 CMI KAO YES YES YES 23FF 0
DS> SET TRA
DS> SEL ALL
DS> RUN EVKAC
.. PROGRAM: VAX Floating Point Instructions Exerciser, ZZ-EVKAC, REV 3.0, 4 TESTS, AT 17:41:40
TESTING: _KA0

TEST 1: Single Precision Floating Point Instructions
TEST 2: Double Precision Floating Point Instructions
TEST 3: Extended Range Double Precision Floating Point Instructions
TEST 4: Extended Range Quadruple Precision Floating Point Instructions
.. END OF RUN. 0 ERRORS DETECTED. PASS COUNT: 1. TIME: 4-MAR-1981 17:47:46.50
DS>

```

Example C-3 DCL Commands

3. The following line shows a filespec with two switches following it.

CS [SYSEXE]GHFLOAT.BIN/BIN/LOAD

4. The above line instructs the KU750 utility to load the OCS with a packed binary image file called GHFLOAT.BIN. The /BIN switch instructs the utility that it is in a binary file; the /LOAD switch indicates that OCS must be loaded.
5. The next command line invokes a test routine that verifies the G and H instructions (Example C-4).
6. For thorough testing, run the VAX floating-point instruction exerciser EVKAC. The ATTACH statement for the processor specifies G and H floating-point instructions and the OCS last address as 23FF.

```

$ ty ghfloat.com
$ ! GHFLOAT.COM WCS utility command procedure
$ CS==$SYS$SYSTEM:KU750UTL
$ CS [SYSEXE]GHFLOAT.BIN/BIN/LOAD
$ EXIT
$

```

Example C-4 G and H Instruction Test Routine

C.4.3 System Start Up Command Procedure Modification

1. A modification to the site specific command procedure ([SYSMGR]SYSTARTUP.COM) should be made if the customer desires the optional control store to be loaded at bootstrap time.
2. Example C-5 shows a command procedure to run the KU750 utility and the input arguments.

```

$ ty [systest]ku750ipc.com
$ RUN [SYSEXEC]KU750TST
$

```

Example C-5 Run KU750 Utility

3. Example C-6 shows a site specific start up command file that will automatically invoke the KU750 utility and load the OCS. The command procedure in [SYSTEST] called KU750IPC runs the program [SYSEXEC]KU750TST. If that program runs successfully, the message...

%UCSMSG-I-INSTOK, GH instructions loaded successfully

is printed at the terminal. Refer to Example C-3 for the format of the [SYSTEST]KU750IPC.COM command file.

```

$ ty systartup.com
$ !      **** Maintability Engineering System Startup ****
$ !
$ MC SYSGEN
CONNECT CONSOLE
$ !
$ ! Set terminal speeds and types
$ !
$ SET TERM TTA0: /PERM /SPEED=9600 /VT52
$ SET TERM TTA1: /PERM /SPEED=9600 /VT100
$ SET TERM TTA2: /PERM /SPEED=300 /LA36
$ SET TERM TTA3: /PERM /SPEED=9600 /VT100
$ SET TERM TTA4: /PERM /SPEED=9600 /VT100
$ SET TERM TTA5: /PERM /SPEED=9600 /VT100
$ SET TERM TTA6: /PERM /SPEED=300 /VT100
$ SET TERM TTA7: /PERM /SPEED=1200 /VT100
$ !
$ ! Make random system definitions
$ !
$ DEFINE/SYS      SYS$MANAGER      SYS$SYSDISK:[SYSMGR]
$ DEFINE/SYS      NET$LIBRARY      WRKD$:[NETLIB]
$ ASSIGN/SYS      SYS$LIBRARY:     EDT$CAI
$ !
$ ! Start batch and printer queues
$ !
$ INIT/QUEUE/BATCH SYS$BATCH/JOB=5/PRI=2
$ START/QUEUE SYS$BATCH
$ !
$ SET PRINTER LPA0: /LOWER
$ SET DEVICE/SPOOLED=LPA0 LPA0
$ ASSIGN/SYSTEM LPA0 SYS$PRINT
$ INIT/QUEUE/FLAG LPA0
$ START/QUEUE LPA0
$ !
$ ! Load G and H Floating Ucode into WCS
$ !
$ @[sysmgr]shfloat.com
$ !
$ ! Test G and H Floating Ucode
$ !
$ @[systest]ku750ipc
$ !
$ ! Announce the system is up
$ !
$ REPLY/ALL/BELL "VAX 11/750 Proto 26 - VAX/VMS Initialized"
$

```

Example C-6 Start Up Command File

4. A command procedure called EXAMPLE.COM, left in the [SYSUPD] area after installing the KU750KIT, shows some of the powerfail recovery options available.
5. Example C-7 shows a cold boot using the site specific command procedure shown in Example C-6.
6. The KU750 option installation is now completed.

%%

VAX/VMS Version V2.2 9-NOV-1980 12:00

Opcom, 4-MAR-1981 17:09:57.27, logfile initialized, operator=...0PA0:

%UCSMMSG-I-INSTOK, GH instructions loaded successfully

Ratch,SYSTEM 17:10:19.01

"VAX 11/750 Proto 26 - VAX/VMS Initialized"

Login quotas - Interactive limit=64, Current interactive value=0

SYSTEM Job terminated at 4-MAR-1981 17:10:22.93

Example C-7 Cold Boot

APPENDIX D

FP750

D.1 INSTALLATION

To install the FP750 perform the following:

1. Power down the VAX-11/750.
2. Remove the FP750 from its shipping container.
3. Plug the FP750 into Slot 1 of the CPU.
4. Power up the VAX-11/750.

D.2 FIELD ACCEPTANCE TESTING

Field acceptance testing is intended to demonstrate the performance of the FP750 to the customer prior to his acceptance of the equipment. Table D-1 shows the diagnostic program used to verify the integrity of the FP750.

Table D-1 FP750 Diagnostic Program

MAINDEC Code	Level	Title
EVKAC	2	VAX Floating-Point Instruction

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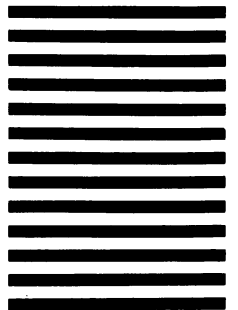
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